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Abstract: We use Razborov's flag algebra method [5] to show a new asymptotic lower bound for the minimal density m_4 of monochromatic K_4 's in any 2-coloring of the edges of the complete graph K_n on n vertices. The hitherto best known lower bound was obtained by Giraud [2], who proved that $m_4 > \frac{1}{46}$, whereas the best known upper bound by Thomason [7] states that $m_4 < \frac{1}{33}$. We can show that $m_4 > \frac{1}{35}$.

1. Introduction

Let c_n be a 2-coloring of the edges of the complete graph K_n on n vertices and $k_t(c_n)$ the number of monochromatic K_t 's in c_n . Now we denote by

$$m_t := \lim_{n \rightarrow \infty} \underbrace{\frac{\min \{k_t(c_n)\}}{\binom{n}{t}}}_{=: r_t(n)} \quad (1)$$

the asymptotic value of the minimal density of monochromatic K_t 's in any 2-coloring of a complete graph. Ramsey's theorem implies that $r_t(n) > 0$ for large enough n and since it is easily shown that $r_t(n)$ increases with n , it follows that the limit in equation (1) exists. Thus, in every simple graph G the minimal density of K_t 's in G and its complement \overline{G} is $m_t + o(1)$.

As an easy consequence of a result of Goodman [3] one gets $m_3 = \frac{1}{4}$. But this is the only known value of m_t , apart from the trivial case $t = 2$ with $m_2 = 1$. In 1964, Erdős [1] conjectured that $m_t = 2^{1-\binom{t}{2}}$. This value can be achieved by a typical random graph. In 1989, Thomason [7] disproved this conjecture by showing that $m_4 < \frac{1}{33}$. But it seems that his construction is not optimal either. He uses a blowup operation to construct a graph with monochromatic K_4 -density lower than $\frac{1}{33}$. But in the final paragraph of [8], Thomason observes that it is possible to improve this construction by a tiny amount using a random perturbation. The only known lower bound for m_4 was given by Giraud [2]. He proved that $m_4 > \frac{1}{46}$. A shorter and English version of his proof can be found in [9]. We will prove in section 3 that $m_4 > \frac{1}{35}$. For our proof we use Razborov's flag algebra method [5]. In section 2 we will roughly explain everything we need from it to make this paper self contained.

For a simple graph G of order n , we write $V(G)$ for its set of vertices, $E(G)$ for its set of edges and \overline{G} for its complement. Thus, $E(G) = E(K_n) \setminus E(\overline{G})$. Furthermore, let $[k] := \{1, 2, \dots, k\}$. We write vectors underlined, e.g. $\underline{v} = (\underline{v}(1), \underline{v}(2), \underline{v}(3))$ is a vector with three coordinates. A collection V_1, \dots, V_t of finite sets is a sunflower with center C if $V_i \cap V_j = C$ for every two distinct $i, j \in [t]$.

2. Flag Algebras

With his theory of flag algebras, Razborov developed a very strong tool for solving some classes of problems in extremal graph theory. For our proof, we will just need a small part of his method, which can be thought of as an application of the Cauchy-Schwarz inequality in the theory of simple graphs. For a detailed study of flag algebras we refer the reader to Razborov's original paper [5]. In this section we will just define the most important ingredients for our calculation. Furthermore, we will give a short introduction into flag algebras, which is very similar to Razborov's presentation in [6].

Let \mathcal{G} be the family of all unlabeled simple graphs considered up to isomorphism. By \mathcal{G}_ℓ we denote the set of all $G \in \mathcal{G}$ with order ℓ . A type σ of order k is a labeled graph of order k . Thus, each vertex of a type can be uniquely identified by its label. Usually, we use the elements of $[k]$ as labels. In our proof we will deal with six types $\sigma_0, \sigma_1, \dots, \sigma_5$ of order 4. These are defined in Figure 1.

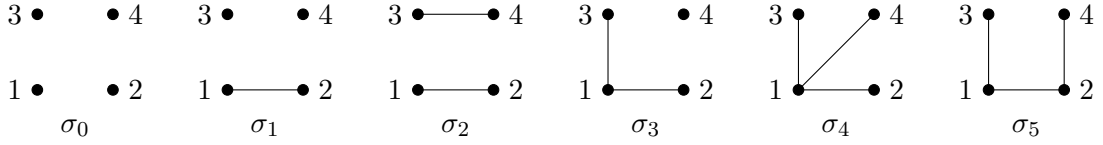


Figure 1: Definition of the types $\sigma_0, \sigma_1, \sigma_2, \sigma_3, \sigma_4, \sigma_5$.

One denotes by 0 the unique type of order 0. Likewise one denotes by 1 the unique type of order 1.

If σ is a type of order k , we define a σ -flag as a pair $F = (G, \theta)$, where $G \in \mathcal{G}$ with $|V(G)| \geq k$ and $\theta : [k] \rightarrow V(G)$ is an injective function, such that the labelled vertices define an induced embedding of σ into G . An isomorphism between two σ -flags (G, θ) and (G', θ') is an isomorphism ϕ between G and G' where $\phi(\theta(i)) = \theta'(i)$. We write \mathcal{F}^σ for the set of all σ -flags up to isomorphism. Again, we define $\mathcal{F}_\ell^\sigma \subseteq \mathcal{F}^\sigma$ as the set of all σ -flags of order ℓ . For example, $\mathcal{F}_\ell^0 = \mathcal{G}_\ell$. If σ is a type of order k , then \mathcal{F}_k^σ consists only of (σ, id) . One denotes this element simply by 1_σ . By definition we know that for every type σ of order k we have $|\mathcal{F}_{k+1}^\sigma| = 2^k$. Thus following notation in [4], for $i = 0, 1, \dots, 5$ and $V \subseteq [4]$ we can denote the elements of $\mathcal{F}_5^{\sigma_i}$ by $F_V^{\sigma_i} = (G, \theta)$, such that $F_V^{\sigma_i}$ is the flag in which the only unlabelled vertex is connected to the set $\{\theta(i) : i \in V\}$.

Follow the notation of [5], we write **math bold face** for random objects.

Definition 1. (from [5])

Fix a type σ of order k , assume that integers $\ell, \ell_1, \dots, \ell_t \geq k$ are such that

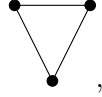
$$\ell_1 + \dots + \ell_t - k(t-1) \leq \ell,$$

and $F = (M, \theta) \in \mathcal{F}_\ell^\sigma$, $F_1 \in \mathcal{F}_{\ell_1}^\sigma, \dots, F_t \in \mathcal{F}_{\ell_t}^\sigma$ are σ -flags. We define the (key) quantity $p(F_1, \dots, F_t; F) \in [0, 1]$ as follows. Choose in $V(M)$ uniformly at random a sunflower $(\mathbf{V}_1, \dots, \mathbf{V}_t)$ with center $im(\theta)$ and $\forall i \ |\mathbf{V}_i| = \ell_i$. We let $p(F_1, \dots, F_t; F)$ denote the probability of the event " $\forall i \in [t] \ F|_{\mathbf{V}_i}$ is isomorphic to F_i ." When $t = 1$, we use the notation $p(F_1, F)$ instead of $p(F_1; F)$.

In the following we can identify a σ -flag F by the probability $p(F, \hat{F})$, where \hat{F} is an arbitrary large enough σ -flag. Thus, for example if we write



we can think of it to be the normalized number of neighbours of a fixed vertex (called "1") in an arbitrary large enough graph. Or if we write



we can think of it to be the triangle-density in an arbitrary large enough graph. Remark that these examples are not formal definitions. It should just allow an easier understanding of the following definitions.

Now, we build formal finite linear combinations of σ -flags. We denote the space which contains these linear combinations by $\mathbb{R}\mathcal{F}^\sigma$. Roughly speaking, if we think of the F -density in a graph of sufficiently large order for a flag $F \in \mathcal{F}_\ell^\sigma$, it seems sensible to call the subspace \mathcal{K}^σ which is generated by all elements of the form

$$F_1 - \sum_{\tilde{F} \in \mathcal{F}_\ell^\sigma} p(F_1, \tilde{F}) \tilde{F},$$

where $F_1 \in \mathcal{F}_{\ell_1}^\sigma$ with $\ell_1 \leq \tilde{\ell}$, the subspace of "identically zero flag parameters". We want to illustrate this by an example. It can be seen by an easy double-counting argument that

$$F_1 = \sum_{\tilde{F} \in \mathcal{F}_\ell^\sigma} p(F_1, \tilde{F}) \tilde{F}. \quad (2)$$

For example, the edge-density in an arbitrary large enough graph can be expressed as a linear combination of induced subgraph-densities of graphs of order 3 in this graph. Thus,

Now it is natural to define $\mathcal{A}^\sigma := \mathbb{R}\mathcal{F}^\sigma / \mathcal{K}^\sigma$ as the flag algebra of the type σ . This means, we factor $\mathbb{R}\mathcal{F}^\sigma$ by the subspace \mathcal{K}^σ . In Lemma 2.4 of [5], Razborov shows that \mathcal{A}^σ is naturally endowed with the structure of a commutative associative algebra. He defines a bilinear mapping for flags in the following way. Let σ be a type of order k . For two σ -flags $F_1 \in \mathcal{F}_{\ell_1}^\sigma$, $F_2 \in \mathcal{F}_{\ell_2}^\sigma$ and $\ell \geq \ell_1 + \ell_2 - k$ we define

$$F_1 \cdot F_2 := \sum_{F \in \mathcal{F}_\ell^\sigma} p(F_1, F_2; F) F.$$

Remark that this definition is not well defined on $\mathbb{R}\mathcal{F}^\sigma$, but on \mathcal{A}^σ it is. The disadvantage of this definition is that this product is just asymptotically the same as the product one would expect, if we interpret the σ -flags in the above way, because

$$p(F_1, F_2; F) = p(F_1, F)p(F_2, F) + o(1).$$

That is why flagalgebraic proofs using this product operation are only asymptotically true.

Additionally, we want to remark in crude words that the function $F \rightarrow p(F, \hat{F})$ for very large \hat{F} asymptotically corresponds to an algebra homomorphism $\phi \in \text{Hom}(\mathcal{A}^\sigma, \mathbb{R})$. Razborov now considers the set

$$\text{Hom}^+(\mathcal{A}^\sigma, \mathbb{R}) := \{\phi \in \text{Hom}(\mathcal{A}^\sigma, \mathbb{R}) \mid \forall F \in \mathcal{F}^\sigma \phi(F) \geq 0\}$$

and shows in Corollary 3.4 of [5] that $\text{Hom}^+(\mathcal{A}^\sigma, \mathbb{R})$ captures all asymptotically true relations in extremal combinatorics.

Thus, we have seen the basic idea of flag algebras. It is useful to define for $f, g \in \mathcal{A}^0$ that $f \geq g$ if $\forall \phi \in \text{Hom}^+(\mathcal{A}^\sigma, \mathbb{R}) (\phi(f) \geq \phi(g))$. This is a partial preorder on \mathcal{A}^0 . Now we want to turn our attention to an application of the Cauchy-Schwarz inequality in flag algebras.

We define the averaging operator $\llbracket \cdot \rrbracket_\sigma : \mathcal{A}^\sigma \rightarrow \mathcal{A}^0$ as follows. For a type σ of order k and $F = (G, \theta) \in \mathcal{F}^\sigma$, let $q_\sigma(F)$ be the probability that a uniformly at random chosen injective mapping $\theta : [k] \rightarrow V(G)$ defines an induced embedding of σ in G and the resulting σ -flag (G, θ) is isomorphic to F . Now, we define

$$\llbracket F \rrbracket_\sigma := q(F) \cdot G$$

partially on \mathcal{F}^σ . In section 2.2 in [5], Razborov proves that this operator can be extended linearly to \mathcal{A}^σ and he explains why it corresponds to averaging.

Theorem 1. *Cauchy-Schwarz inequality* (from [5], Theorem 3.14)

Let $f, g \in \mathcal{F}^\sigma$, then

$$\llbracket f^2 \rrbracket_\sigma \cdot \llbracket g^2 \rrbracket_\sigma \geq \llbracket fg \rrbracket_\sigma^2.$$

In particular ($g = 1_\sigma$),

$$\llbracket f^2 \rrbracket_\sigma \cdot \sigma \geq \llbracket f \rrbracket_\sigma^2,$$

which in turn implies

$$\llbracket f^2 \rrbracket_\sigma \geq 0.$$

As an example, we want to show that $m_3 = \frac{1}{4}$.

At first, we consider the normalized number of pairs of neighbours of one fixed vertex. There are two options, either there is an edge or there is no edge between such a pair. Thus, we can express this normalized number by the following linear combination of σ -flags, which is asymptotically the same as the square of the normalized number of neighbours of the fixed vertex.

$$\begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} + \begin{array}{c} \bullet \\ \diagdown \quad \diagup \\ \bullet \quad \bullet \\ \diagup \quad \diagdown \\ \bullet \end{array} = \left(\begin{array}{c} \bullet \\ \bullet \\ \bullet \\ \bullet \end{array} \right)^2$$

Now we want to average this normalized number for all choices of fixed vertices. Then we get

$$\left[\left(\begin{array}{c} \bullet \\ | \\ \bullet \\ | \\ \bullet \end{array} \right)^2 \right]_1 = \left[\begin{array}{c} \bullet & \bullet \\ / & \backslash \\ \bullet \end{array} + \begin{array}{c} \bullet & \bullet \\ \backslash & / \\ \bullet \end{array} \right]_1 = \begin{array}{c} \bullet & \bullet \\ / & \backslash \\ \bullet \end{array} + \frac{1}{3} \begin{array}{c} \bullet & \bullet \\ \backslash & / \\ \bullet \end{array}. \quad (3)$$

Analogously, one can derive

$$\left[\left(\begin{array}{c} \bullet \\ | \\ \bullet \end{array} \right)^2 \right]_1 = \left[\begin{array}{c} \bullet & \bullet \\ | & | \\ \bullet & \bullet \end{array} + \begin{array}{c} \bullet & \bullet \\ \backslash & / \\ \bullet \end{array} \right]_1 = \begin{array}{c} \bullet & \bullet \\ | & | \\ \bullet & \bullet \end{array} + \frac{1}{3} \begin{array}{c} \bullet & \bullet \\ \backslash & / \\ \bullet \end{array}. \quad (4)$$

Using a similar double-counting idea as in equation (2), one can see that

$$1 = \begin{array}{c} \bullet & \bullet \\ / & \backslash \\ \bullet \end{array} + \begin{array}{c} \bullet & \bullet \\ \backslash & / \\ \bullet \end{array} + \begin{array}{c} \bullet & \bullet \\ | & | \\ \bullet & \bullet \end{array} + \begin{array}{c} \bullet & \bullet \\ \backslash & / \\ \bullet \end{array}. \quad (5)$$

Now the equations (3), (4) and (5) and an application of Theorem 1 tell us that

$$\begin{aligned} \begin{array}{c} \bullet & \bullet \\ / & \backslash \\ \bullet \end{array} + \begin{array}{c} \bullet & \bullet \\ | & | \\ \bullet & \bullet \end{array} &= \frac{3}{2} \left(\left[\left(\begin{array}{c} \bullet \\ | \\ \bullet \end{array} \right)^2 \right]_1 + \left[\left(\begin{array}{c} \bullet \\ | \\ \bullet \end{array} \right)^2 \right]_1 \right) - \frac{1}{2} \\ &\geq \frac{3}{2} \left(\left(\left[\begin{array}{c} \bullet \\ | \\ \bullet \end{array} \right]_1 \right)^2 + \left(\left[\begin{array}{c} \bullet \\ | \\ \bullet \end{array} \right]_1 \right)^2 \right) - \frac{1}{2} \\ &= \frac{3}{2} \left(\left(\begin{array}{c} \bullet \\ | \\ \bullet \end{array} \right)^2 + \left(1 - \begin{array}{c} \bullet \\ | \\ \bullet \end{array} \right)^2 \right) \\ &= 3 \left(\begin{array}{c} \bullet \\ | \\ \bullet \end{array} \right)^2 - 3 \begin{array}{c} \bullet \\ | \\ \bullet \end{array} + 1. \end{aligned}$$

The righthandside depends only on the edge-density \downarrow , which can be minimized by taking $\downarrow = \frac{1}{2}$. Thus, we have

$$\begin{array}{c} \bullet & \bullet \\ / & \backslash \\ \bullet \end{array} + \begin{array}{c} \bullet & \bullet \\ | & | \\ \bullet & \bullet \end{array} \geq \frac{1}{4} \Rightarrow m_3 \geq \frac{1}{4}.$$

On the other hand it is easy to see that $m_3 \leq \frac{1}{4}$, since a typical random graph achieves $\frac{1}{4}$.

We need some further notation for our calculations. For a σ -flag $F = (G, \theta)$ we define its complement $\overline{F} \in \mathcal{F}^{\overline{\sigma}}$ as (\overline{G}, θ) . If \underline{v} is a vector of n σ -flags, then $\overline{\underline{v}} := (\overline{v(1)}, \dots, \overline{v(n)})$. Let σ be a type, then we denote by $Aut(\sigma)$ its group of automorphisms (for example $Aut(\sigma_4) \cong S_3$ and $Aut(\sigma_1) \cong \mathbb{Z}_2 \times \mathbb{Z}_2$). Furthermore, we define $f_V^\sigma \in \mathcal{A}^\sigma$ by

$$f_V^\sigma := \sum_{\eta \in Aut(\sigma)} F_{\eta(V)}^\sigma.$$

Notice that these elements are $Aut(\sigma)$ -invariant. It is an easy consequence of Theorem 1 that $\llbracket \underline{v}^T A \underline{v} \rrbracket_\sigma \geq 0$, if \underline{v} is a vector of n σ -flags and $A \in \mathbb{R}^{n \times n}$ is symmetric positive semidefinite.

Each element of \mathcal{A}^σ can be written as a direct sum of its $Aut(\sigma)$ -invariant part and its $Aut(\sigma)$ -antiinvariant part ($f \in \mathcal{A}^\sigma$ is called antiinvariant, if $\sum_{\eta \in Aut(\sigma)} \eta(f) = 0$). It is easy to see that if $f \in \mathcal{A}^\sigma$ is invariant and $g \in \mathcal{A}^\sigma$ is antiinvariant, then $\llbracket fg \rrbracket_\sigma = 0$. Hence, if we work with positive semidefinite matrices A like above, we can split them for each type in an invariant part (denoted by "+") and an antiinvariant part (denoted by "-"). For a more detailed explanation of this direct sum decomposition see e.g. section 4 of [6].

3. Main Result

A lot of calculations in our proof deal with linear combinations of elements of \mathcal{G}_6 . We have written a computer program to determine the elements of \mathcal{G}_6 . It turns out that $|\mathcal{G}_6| = 156$. In Appendix A we give a list of the elements G_i for $i \in \{0, \dots, 155\}$ of \mathcal{G}_6 .

Theorem 2.

$$m_4 \geq \frac{1}{34.7858}$$

Proof. At first we define some vectors g_i^* and matrices A^{i*} (see Appendix B). With the help of these, the proof is given by the following inequality.

$$\begin{aligned} \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \end{array} + \begin{array}{c} \bullet \\ \bullet \end{array} - \frac{1}{34.7858} &\geq \sum_{i=0}^5 \left[\left(\underline{g}_i^+ \right)^T A^{i+} \underline{g}_i^+ \right]_{\sigma_i} + \sum_{i \in \{1,2,3,5\}} \left[\left(\underline{g}_i^- \right)^T A^{i-} \underline{g}_i^- \right]_{\sigma_i} \\ &+ \sum_{i=0}^4 \left[\left(\overline{\underline{g}}_i^+ \right)^T A^{i+} \overline{\underline{g}}_i^+ \right]_{\sigma_i} + \sum_{i=1}^3 \left[\left(\overline{\underline{g}}_i^- \right)^T A^{i-} \overline{\underline{g}}_i^- \right]_{\sigma_i} \\ &\geq 0 \end{aligned} \quad (6)$$

In Appendix C one can find a table which helps to verify inequality (6).

□

3.1. Some remarks

Most parts of the proof were done by a computer. At first we decided to work in \mathcal{G}_6 . Then we took types of order 4. Thus, if we take products of two σ -flags on 5 vertices, where the types have order 4, then our calculus works in \mathcal{G}_6 . The vectors g_i^+ and g_i^- are chosen in such a way that we have a generating system of the corresponding invariant or antiinvariant part of \mathcal{A}^{σ_i} . After that we used a computer program to calculate the equations which the semidefinite matrices A_i^* have to fulfill such that we can prove theorem 2. Finally, the determination of the matrices was simply done by a sufficiently close rational approximation to the outcome of a numerical semidefinite-program-solver. The decision to ignore some antiinvariant parts and to work with the same matrices for the complementary types belong to computer experiments.

The computational effort was low enough to try the proof in our setting (in \mathcal{G}_6 with types of order 4) in the most general way with 11 types and thus with 22 matrices. But even then, we could not improve our lower bound of m_4 essentially (It was not possible to show $\frac{1}{34.7857}$).

References

- [1] Paul Erdős *On the number of complete subgraphs contained in certain graphs* Publ. Math. Inst. Hung. Acad. Sci. VII **Ser. A 3** (1962), 459-464.
- [2] Guy Giraud *Sur le problème de Goodman pour les Quadrangles et la Majoration des Nombres de Ramsey* Journal of Combinatorial Theory **Series B 27** (1979), 237-253.
- [3] A. W. Goodman *On sets of acquaintances and strangers at any party* American Mathematical Monthly **66** (1959), 778-783.
- [4] H. Hatami, J. Hladký, D. Král', S. Norine, A. A. Razborov *Non-three colorable common graphs exist* <http://arxiv.org/abs/1105.0307> (2011)
- [5] Alexander A. Razborov *Flag algebras* Journal of Symbolic Logic **72(4)** (2007), 1239-1282.
- [6] Alexander A. Razborov *On 3-Hypergraphs with forbidden 4-vertex configurations* SIAM Journal Discrete Math. **24(3)** (2010), 946-963.
- [7] Andrew Thomason *A disproof of a conjecture of Erdős in Ramsey theory* Journal of the London Mathematical Society **39(2)** (1989), 246-255.
- [8] Andrew Thomason *Graph products and monochromatic multiplicities* Combinatorica **17(1)** (1997), 125-134.
- [9] J. Wolf *The minimum number of monochromatic 4-term progressions in \mathbb{Z}_p* Journal of Combinatorics **1(1)** (2010), 53-68.

A. Appendix: The 156 Graphs

The following table defines the 156 graphs of \mathcal{G}_6 .

	$E(G_i)$
G_0	
G_1	{1, 2}
G_2	{1, 2}{1, 3}
G_3	{1, 2}{1, 3}{2, 3}
G_4	{1, 2}{1, 3}{2, 3}{1, 4}
G_5	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}
G_6	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}
G_7	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}
G_8	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}
G_9	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}
G_{10}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{4, 5}
G_{11}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{4, 5}{1, 6}
G_{12}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{4, 5}{1, 6}{2, 6}
G_{13}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{4, 5}{1, 6}{2, 6}{3, 6}
G_{14}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{4, 5}{1, 6}{2, 6}{3, 6}{4, 6}
G_{15}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{4, 5}{1, 6}{2, 6}{3, 6}{4, 6}{5, 6}
G_{16}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{1, 6}
G_{17}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{1, 6}{2, 6}
G_{18}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{1, 6}{2, 6}{3, 6}
G_{19}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{1, 6}{2, 6}{4, 6}
G_{20}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{1, 6}{2, 6}{4, 6}{5, 6}
G_{21}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{1, 6}{4, 6}
G_{22}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{1, 6}{4, 6}{5, 6}
G_{23}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{4, 6}
G_{24}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 5}{4, 6}{5, 6}
G_{25}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{1, 6}
G_{26}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{1, 6}{2, 6}
G_{27}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{1, 6}{2, 6}{5, 6}
G_{28}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{1, 6}{3, 6}
G_{29}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{1, 6}{3, 6}{5, 6}
G_{30}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{1, 6}{5, 6}
G_{31}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 6}
G_{32}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 6}{4, 6}
G_{33}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 6}{4, 6}{5, 6}
G_{34}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{3, 6}{5, 6}
G_{35}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 5}{5, 6}
G_{36}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{1, 6}
G_{37}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{1, 6}{5, 6}
G_{38}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 6}
G_{39}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{2, 6}{5, 6}
G_{40}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{1, 5}{5, 6}
G_{41}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{3, 4}{5, 6}
G_{42}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}
G_{43}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}
G_{44}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}{1, 6}
G_{45}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}{1, 6}{2, 6}
G_{46}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}{1, 6}{3, 6}
G_{47}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}{1, 6}{3, 6}{4, 6}
G_{48}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}{1, 6}{3, 6}{4, 6}{5, 6}
G_{49}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}{3, 6}
G_{50}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}{3, 6}{4, 6}
G_{51}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{2, 5}{3, 6}{4, 6}{5, 6}
G_{52}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}
G_{53}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}{4, 5}
G_{54}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}{4, 5}{1, 6}
G_{55}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}{4, 5}{2, 6}
G_{56}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}{4, 5}{2, 6}{3, 6}
G_{57}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}{4, 5}{2, 6}{3, 6}{4, 6}
G_{58}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}{4, 5}{2, 6}{3, 6}{4, 6}{5, 6}
G_{59}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}{4, 5}{2, 6}{5, 6}
G_{60}	{1, 2}{1, 3}{2, 3}{1, 4}{2, 4}{1, 5}{3, 5}{1, 6}
G_{61}	{1, 2}{1, 3}{2,

G_{73}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{1, 5\}\{2, 6\}\{5, 6\}$
G_{74}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{1, 5\}\{3, 6\}$
G_{75}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{1, 5\}\{3, 6\}\{4, 6\}$
G_{76}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{1, 5\}\{3, 6\}\{4, 6\}\{5, 6\}$
G_{77}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{1, 5\}\{3, 6\}\{5, 6\}$
G_{78}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{1, 5\}\{5, 6\}$
G_{79}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}$
G_{80}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{4, 5\}$
G_{81}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{4, 5\}\{3, 6\}$
G_{82}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{4, 5\}\{3, 6\}\{4, 6\}$
G_{83}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{4, 5\}\{3, 6\}\{4, 6\}\{5, 6\}$
G_{84}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{4, 5\}\{3, 6\}\{5, 6\}$
G_{85}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{4, 5\}\{5, 6\}$
G_{86}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{3, 6\}$
G_{87}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{3, 6\}\{5, 6\}$
G_{88}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{4, 6\}$
G_{89}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{4, 6\}\{5, 6\}$
G_{90}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{3, 5\}\{5, 6\}$
G_{91}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 4\}\{5, 6\}$
G_{92}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}$
G_{93}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{4, 5\}$
G_{94}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{4, 5\}\{1, 6\}$
G_{95}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{4, 5\}\{2, 6\}$
G_{96}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{4, 5\}\{2, 6\}\{4, 6\}$
G_{97}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{1, 6\}$
G_{98}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{2, 6\}$
G_{99}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{2, 6\}\{4, 6\}$
G_{100}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{2, 6\}\{4, 6\}\{5, 6\}$
G_{101}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{4, 6\}$
G_{102}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{1, 5\}\{4, 6\}\{5, 6\}$
G_{103}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}$
G_{104}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{4, 5\}$
G_{105}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{4, 5\}\{3, 6\}$
G_{106}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{4, 5\}\{3, 6\}\{4, 6\}$
G_{107}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{4, 5\}\{3, 6\}\{4, 6\}\{5, 6\}$
G_{108}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{4, 5\}\{4, 6\}$
G_{109}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{4, 5\}\{4, 6\}\{5, 6\}$
G_{110}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{3, 6\}$
G_{111}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{4, 6\}$
G_{112}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{2, 5\}\{4, 6\}\{5, 6\}$
G_{113}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{4, 5\}$
G_{114}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{4, 5\}\{4, 6\}$
G_{115}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{4, 5\}\{4, 6\}\{5, 6\}$
G_{116}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{4, 5\}\{5, 6\}$
G_{117}	$\{1, 2\}\{1, 3\}\{2, 3\}\{1, 4\}\{5, 6\}$
G_{118}	$\{1, 2\}\{1, 3\}\{2, 3\}\{4, 5\}$
G_{119}	$\{1, 2\}\{1, 3\}\{2, 3\}\{4, 5\}\{4, 6\}$
G_{120}	$\{1, 2\}\{1, 3\}\{2, 3\}\{4, 5\}\{4, 6\}\{5, 6\}$
G_{121}	$\{1, 2\}\{1, 3\}\{1, 4\}$
G_{122}	$\{1, 2\}\{1, 3\}\{1, 4\}\{1, 5\}$
G_{123}	$\{1, 2\}\{1, 3\}\{1, 4\}\{1, 5\}\{1, 6\}$
G_{124}	$\{1, 2\}\{1, 3\}\{1, 4\}\{1, 5\}\{2, 6\}$
G_{125}	$\{1, 2\}\{1, 3\}\{1, 4\}\{1, 5\}\{2, 6\}\{3, 6\}$
G_{126}	$\{1, 2\}\{1, 3\}\{1, 4\}\{1, 5\}\{2, 6\}\{3, 6\}\{4, 6\}$
G_{127}	$\{1, 2\}\{1, 3\}\{1, 4\}\{1, 5\}\{2, 6\}\{3, 6\}\{4, 6\}\{5, 6\}$
G_{128}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}$
G_{129}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}$
G_{130}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{4, 5\}$
G_{131}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{4, 5\}\{2, 6\}$
G_{132}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{4, 5\}\{2, 6\}\{3, 6\}$
G_{133}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{4, 5\}\{2, 6\}\{3, 6\}\{4, 6\}$
G_{134}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{2, 6\}$
G_{135}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{2, 6\}\{4, 6\}$
G_{136}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{4, 6\}$
G_{137}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{4, 6\}\{5, 6\}$
G_{138}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 5\}\{5, 6\}$
G_{139}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{2, 6\}$
G_{140}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 6\}$
G_{141}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{3, 6\}\{5, 6\}$
G_{142}	$\{1, 2\}\{1, 3\}\{1, 4\}\{2, 5\}\{5, 6\}$
G_{143}	$\{1, 2\}\{1, 3\}\{1, 4\}\{5, 6\}$
G_{144}	$\{1, 2\}\{1, 3\}\{2, 4\}$
G_{145}	$\{1, 2\}\{1, 3\}\{2, 4\}\{3, 4\}$
G_{146}	$\{1, 2\}\{1, 3\}\{2, 4\}\{3, 4\}\{5, 6\}$
G_{147}	$\{1, 2\}\{1, 3\}\{2, 4\}\{3, 5\}$
G_{148}	$\{1, 2\}\{1, 3\}\{2, 4\}\{3, 5\}\{4, 5\}$
G_{149}	$\{1, 2\}\{1, 3\}\{2, 4\}\{3, 5\}\{4, 6\}$
G_{150}	$\{1, 2\}\{1, 3\}\{2, 4\}\{3, 5\}\{4, 6\}\{5, 6\}$
G_{151}	$\{1, 2\}\{1, 3\}\{2, 4\}\{5, 6\}$

G_{152}	$\{1, 2\}\{1, 3\}\{4, 5\}$
G_{153}	$\{1, 2\}\{1, 3\}\{4, 5\}\{4, 6\}$
G_{154}	$\{1, 2\}\{3, 4\}$
G_{155}	$\{1, 2\}\{3, 4\}\{5, 6\}$

B. Appendix: Definition of the vectors and matrices

Here we define the vectors and matrices which are needed in the proof of Theorem 2. At first, we define the vectors which belong to the invariant parts of the corresponding types.

$$\begin{aligned}
\underline{g_0}^+ &:= \left(f_{\emptyset}^{\sigma_0}, f_{\{1\}}^{\sigma_0}, f_{\{1,2\}}^{\sigma_0}, f_{\{1,2,3\}}^{\sigma_0}, f_{[4]}^{\sigma_0} \right) \\
\underline{g_1}^+ &:= \left(f_{\emptyset}^{\sigma_1}, f_{\{1\}}^{\sigma_1}, f_{\{3\}}^{\sigma_1}, f_{\{1,2\}}^{\sigma_1}, f_{\{1,3\}}^{\sigma_1}, f_{\{3,4\}}^{\sigma_1}, f_{\{1,2,3\}}^{\sigma_1}, f_{\{1,3,4\}}^{\sigma_1}, f_{[4]}^{\sigma_1} \right) \\
\underline{g_2}^+ &:= \left(f_{\emptyset}^{\sigma_2}, f_{\{1\}}^{\sigma_2}, f_{\{1,2\}}^{\sigma_2}, f_{\{1,3\}}^{\sigma_2}, f_{\{1,2,3\}}^{\sigma_2}, f_{[4]}^{\sigma_2} \right) \\
\underline{g_3}^+ &:= \left(f_{\emptyset}^{\sigma_3}, f_{\{1\}}^{\sigma_3}, f_{\{2\}}^{\sigma_3}, f_{\{4\}}^{\sigma_3}, f_{\{1,4\}}^{\sigma_3}, f_{\{2,3\}}^{\sigma_3}, f_{\{1,2\}}^{\sigma_3}, f_{\{2,4\}}^{\sigma_3}, f_{\{1,2,3\}}^{\sigma_3}, f_{\{1,2,4\}}^{\sigma_3}, f_{\{2,3,4\}}^{\sigma_3}, f_{[4]}^{\sigma_3} \right) \\
\underline{g_4}^+ &:= \left(f_{\emptyset}^{\sigma_4}, f_{\{1\}}^{\sigma_4}, f_{\{2\}}^{\sigma_4}, f_{\{1,2\}}^{\sigma_4}, f_{\{2,3\}}^{\sigma_4}, f_{\{1,2,3\}}^{\sigma_4}, f_{\{2,3,4\}}^{\sigma_4}, f_{[4]}^{\sigma_4} \right) \\
\underline{g_5}^+ &:= \left(f_{\emptyset}^{\sigma_5}, f_{\{1\}}^{\sigma_5}, f_{\{3\}}^{\sigma_5}, f_{\{1,2\}}^{\sigma_5}, f_{\{3,4\}}^{\sigma_5}, f_{\{1,3\}}^{\sigma_5}, f_{\{1,4\}}^{\sigma_5}, f_{\{1,2,3\}}^{\sigma_5}, f_{\{1,3,4\}}^{\sigma_5}, f_{[4]}^{\sigma_5} \right)
\end{aligned}$$

Now we define the vectors which belong to the anti-invariant parts of the corresponding types.

$$\begin{aligned}
\underline{g_1}^- &:= \left(F_{\{1\}}^{\sigma_1} - F_{\{2\}}^{\sigma_1}, F_{\{3\}}^{\sigma_1} - F_{\{4\}}^{\sigma_1}, F_{\{1,3\}}^{\sigma_1} - F_{\{2,3\}}^{\sigma_1}, F_{\{1,3\}}^{\sigma_1} - F_{\{1,4\}}^{\sigma_1}, F_{\{1,3\}}^{\sigma_1} - F_{\{2,4\}}^{\sigma_1}, \right. \\
&\quad \left. F_{\{1,3,4\}}^{\sigma_1} - F_{\{2,3,4\}}^{\sigma_1}, F_{\{1,2,3\}}^{\sigma_1} - F_{\{1,2,4\}}^{\sigma_1} \right) \\
\underline{g_2}^- &:= \left(F_{\{1\}}^{\sigma_2} - F_{\{2\}}^{\sigma_2}, F_{\{1,2\}}^{\sigma_2} - F_{\{3,4\}}^{\sigma_2}, F_{\{1,3\}}^{\sigma_2} - F_{\{1,4\}}^{\sigma_2}, F_{\{1,2,3\}}^{\sigma_2} - F_{\{1,2,4\}}^{\sigma_2}, \right. \\
&\quad \left. F_{\{1,2,3\}}^{\sigma_2} - F_{\{1,3,4\}}^{\sigma_2}, F_{\{1,3\}}^{\sigma_2} - F_{\{2,4\}}^{\sigma_2} \right) \\
\underline{g_3}^- &:= \left(F_{\{2\}}^{\sigma_3} - F_{\{3\}}^{\sigma_3}, F_{\{1,2\}}^{\sigma_3} - F_{\{1,3\}}^{\sigma_3}, F_{\{2,4\}}^{\sigma_3} - F_{\{3,4\}}^{\sigma_3}, F_{\{1,2,4\}}^{\sigma_3} - F_{\{1,3,4\}}^{\sigma_3}, \right. \\
\underline{g_5}^- &:= \left(F_{\{1\}}^{\sigma_5} - F_{\{2\}}^{\sigma_5}, F_{\{3\}}^{\sigma_5} - F_{\{4\}}^{\sigma_5}, F_{\{1,3\}}^{\sigma_5} - F_{\{2,4\}}^{\sigma_5}, F_{\{1,4\}}^{\sigma_5} - F_{\{2,3\}}^{\sigma_5}, \right. \\
&\quad \left. F_{\{1,2,3\}}^{\sigma_5} - F_{\{1,2,4\}}^{\sigma_5}, F_{\{1,3,4\}}^{\sigma_5} - F_{\{2,3,4\}}^{\sigma_5} \right)
\end{aligned}$$

Furthermore, the definition of the required symmetric positive definite matrices.

$$A^{0+} := \frac{1}{10^{10}} \begin{pmatrix} 16862005 & 5938009 & 10666588 & 3932432 & -16602234 \\ 5938009 & 2092561 & 3755186 & 1382600 & -5846206 \\ 10666588 & 3755186 & 6748387 & 2489266 & -10502546 \\ 3932432 & 1382600 & 2489266 & 920571 & -3872384 \\ -16602234 & -5846206 & -10502546 & -3872384 & 16346570 \end{pmatrix}$$

$$\begin{aligned}
A^{1+} &:= \frac{1}{10^{10}} \begin{pmatrix} 4320915081 & 5114912033 & 0838876074 & 20166387 & -720812722 & \\ 5114912033 & 7305691770 & 1132075909 & -213140155 & -239779535 & \\ 838876074 & 1132075909 & 4258272084 & -4128294302 & -2560148834 & \\ 20166387 & -0213140155 & -4128294302 & 4176995622 & 2383723976 & \\ -720812722 & -0239779535 & -2560148834 & 2383723976 & 1953845159 & \dots \\ -3536992459 & -3834927363 & 1822789967 & -2569691611 & -736358264 & \\ 832941643 & 0635345271 & 0359072249 & -166507792 & -472411192 & \\ -3812420339 & -5515309466 & 3014089726 & -3717449251 & -2224367556 & \\ -1928295121 & -2126188382 & -2780770750 & 2399954498 & 1886952203 & \\ \dots & -3536992459 & 832941643 & -3812420339 & -1928295121 & \\ -3834927363 & 635345271 & -5515309466 & -2126188382 & & \\ 1822789967 & 359072249 & 3014089726 & -2780770750 & & \\ -2569691611 & -166507792 & -3717449251 & 2399954498 & & \\ -736358264 & -472411192 & -2224367556 & 1886952203 & & \\ 4494029803 & -646218304 & 5173661199 & 160104823 & & \\ -646218304 & 292587053 & -217236155 & -567828688 & & \\ 5173661199 & -217236155 & 7837719380 & -728044396 & & \\ 160104823 & -567828688 & -728044396 & 2327049595 & & \end{pmatrix} \\
A^{2+} &:= \frac{1}{10^{10}} \begin{pmatrix} 159078056 & 307070840 & -132946711 & 37583858 & -260766405 & -15356594 \\ 307070840 & 592875018 & -256638654 & 72586497 & -503453484 & -29630203 \\ -132946711 & -256638654 & 111109118 & -31412932 & 217937464 & 12832453 \\ 37583858 & 72586497 & -31412932 & 8890997 & -61635435 & -3624388 \\ -260766405 & -503453484 & 217937464 & -61635435 & 427522394 & 25164249 \\ -15356594 & -29630203 & 12832453 & -3624388 & 25164249 & 1484928 \end{pmatrix} \\
A^{3+} &:= \frac{1}{10^{10}} \begin{pmatrix} 9911130076 & 9648505978 & 16664349190 & 9328739972 & 936324078 & 2061273472 \\ 9648505978 & 24617473150 & 7220730652 & 10720412510 & 5131566980 & -23771485619 \\ 16664349190 & 7220730652 & 46274936407 & 19324364441 & 1907848702 & 24288819932 \\ 9328739972 & 10720412510 & 19324364441 & 15648801231 & 6256538527 & -1977377203 \\ 936324078 & 5131566980 & 1907848702 & 6256538527 & 8925400310 & -12787276407 \\ 2061273472 & -23771485619 & 24288819932 & -1977377203 & -12787276407 & 53782517217 \\ \dots & -18294412578 & -17850876485 & -45321487336 & -33168309077 & -15412214883 \\ -18294412578 & -17850876485 & -45321487336 & -33168309077 & -15412214883 & -868355423 \\ -601754032 & -4390712397 & 8672825757 & 8687065569 & -943394603 & 13124014881 \\ -14953562741 & -9564752218 & -39851589035 & -20084517669 & -1900335064 & -18100206208 \\ 7093611190 & 11908193393 & -121391261 & 6898543540 & 9339492106 & -20811949215 \\ 2572438455 & 332196382 & 13726291191 & 369165438 & -4547421833 & 13307983466 \\ -16848495399 & -15745854235 & -39096523027 & -16479279662 & -1971257917 & -10251510005 \\ \dots & -18294412578 & -601754032 & -14953562741 & 7093611190 & 2572438455 \\ -18294412578 & -601754032 & -14953562741 & 7093611190 & 2572438455 & -16848495399 \\ -17850876485 & -4390712397 & -9564752218 & 11908193393 & 332196382 & -15745854235 \\ -45321487336 & 8672825757 & -39851589035 & -121391261 & 13726291191 & -39096523027 \\ -33168309077 & 8687065569 & -20084517669 & 6898543540 & 369165438 & -16479279662 \\ -15412214883 & -943394603 & -1900335064 & 9339492106 & -4547421833 & -1971257917 \\ -868355423 & 13124014881 & -18100206208 & -20811949215 & 13307983466 & -10251510005 \\ 74259569245 & -18500163943 & 44501159648 & -12830955695 & -2623240855 & 36726257026 \\ -18500163943 & 26851070841 & -14712006368 & -14887887504 & 2474708345 & 145079825 \\ 44501159648 & -14712006368 & 37588543382 & 2251374141 & -11236080891 & 33285652211 \\ -12830955695 & -14887887504 & 2251374141 & 27039750365 & -11338452479 & -3895727030 \\ -2623240855 & 2474708345 & -11236080891 & -11338452479 & 11811598967 & -13441522231 \\ 36726257026 & 145079825 & 33285652211 & -3895727030 & -13441522231 & 38903952142 \end{pmatrix}
\end{aligned}$$

$$\begin{aligned}
A^{4+} &:= \frac{1}{10^{10}} \left(\begin{array}{cccc}
46800933 & 104186657 & 371956795 & -340593608 \\
104186657 & 1038914521 & 1914699035 & -785600961 \\
371956795 & 1914699035 & 4419934269 & -2744302275 \\
-340593608 & -785600961 & -2744302275 & 2480213000 \quad \dots \\
-137441315 & -720439710 & -1650449523 & 1014306440 \\
85811179 & -1047011245 & -985196472 & -582494082 \\
-55302691 & -230276564 & -583791454 & 406095485 \\
-103112540 & -979995373 & -1830092885 & 775885584 \\
-137441315 & 85811179 & -55302691 & -103112540 \\
-720439710 & -1047011245 & -230276564 & -979995373 \\
-1650449523 & -985196472 & -583791454 & -1830092885 \\
1014306440 & -582494082 & 406095485 & 775885584 \\
616737186 & 383571355 & 217523075 & 688175720 \\
383571355 & 2057167346 & 62880166 & 962384782 \\
217523075 & 62880166 & 79623311 & 221456205 \\
688175720 & 962384782 & 221456205 & 925107090
\end{array} \right) \\
\\
A^{5+} &:= \frac{1}{10^{10}} \left(\begin{array}{ccccc}
357787678 & 2667561490 & -3158511012 & -1321494554 & -719607624 \\
2667561490 & 23782098207 & -27470938499 & -4462773752 & -7685990746 \\
-3158511012 & -27470938499 & 31843561651 & 6263699767 & 8686163322 \\
-1321494554 & -4462773752 & 6263699767 & 12586569384 & -595804570 \\
-0719607624 & -7685990746 & 8686163322 & -595804570 & 2853679962 \quad \dots \\
-0749034428 & -7099675831 & 8132219053 & 602235047 & 2416214541 \\
-0746618224 & -7127076574 & 8165113979 & 602235047 & 2416214542 \\
2667573049 & 23752965113 & -27444445656 & -4462773755 & -7685990744 \\
-3159785490 & -27444445649 & 31809130251 & 6263699777 & 8686163317 \\
356118081 & 2667573049 & -3159785490 & -1321494554 & -719607624 \\
-749034428 & -746618224 & 2667573049 & -3159785490 & 356118081 \\
-7099675831 & -7127076574 & 23752965113 & -27444445649 & 2667573049 \\
8132219053 & 8165113979 & -27444445656 & 31809130251 & -3159785490 \\
602235047 & 602235047 & -4462773755 & 6263699777 & -1321494554 \\
\dots & 2416214541 & 2416214542 & -7685990744 & 8686163317 & -719607624 \\
2201093330 & 2167739656 & -7127076574 & 8165113978 & -746618224 \\
2167739656 & 2201093330 & -7099675831 & 8132219049 & -749034428 \\
-7127076574 & -7099675831 & 23782098207 & -27470938496 & 2667561490 \\
8165113978 & 8132219049 & -27470938496 & 31843561644 & -3158511012 \\
-746618224 & -749034428 & 2667561490 & -3158511012 & 357787678
\end{array} \right)
\end{aligned}$$

$$\begin{aligned}
A^{1-} &:= \frac{1}{10^{10}} \begin{pmatrix} 14307490741 & 2586781945 & 9478561500 & -8503040278 & & \\ 2586781945 & 24279644543 & -19491862247 & 21589760706 & & \\ 9478561500 & -19491862247 & 28964735982 & -22441455520 & & \\ -8503040278 & 21589760706 & -22441455520 & 31332129348 & & \dots \\ 13318186182 & 23618557200 & -13855425214 & 8889128831 & & \\ 8372793763 & 1525766074 & 5548458322 & -4968118814 & & \\ 1755357971 & 16315840647 & -13131926293 & 14676776308 & & \\ & 13318186182 & 8372793763 & 1755357971 & & \\ & 23618557200 & 1525766074 & 16315840647 & & \\ & -13855425214 & 5548458322 & -13131926293 & & \\ \dots & 8889128831 & -4968118814 & 14676776308 & & \\ & 35089388707 & 7808231324 & 15932298681 & & \\ & 7808231324 & 4915982899 & 1034856802 & & \\ & 15932298681 & 1034856802 & 13507587054 & & \end{pmatrix} \\
A^{2-} &:= \frac{1}{10^{10}} \begin{pmatrix} 39301474130 & -12586488688 & -26325499489 & 4835146333 & -3200582867 & 39402624169 \\ -12586488688 & 4648340313 & 8427369658 & -1582302739 & 1181917652 & -12615039089 \\ -26325499489 & 8427369658 & 17666210517 & -3224681746 & 2142974291 & -26409599889 \\ 4835146333 & -1582302739 & -3224681746 & 2763326005 & -402442928 & 4847377916 \\ -3200582867 & 1181917652 & 2142974291 & -402442928 & 300536605 & -3207844812 \\ 39402624169 & -12615039089 & -26409599889 & 4847377916 & -3207844812 & 39528119078 \end{pmatrix} \\
A^{3-} &:= \frac{1}{10^{10}} \begin{pmatrix} 73874538950 & 72373625861 & 10093264001 & 24183549820 \\ 72373625861 & 93054314984 & 11635620671 & 29507918873 \\ 10093264001 & 11635620671 & 1546846146 & 4342975799 \\ 24183549820 & 29507918873 & 4342975799 & 59399032160 \end{pmatrix} \\
A^{5-} &:= \frac{1}{10^{10}} \begin{pmatrix} 9930361952 & -8840932504 & 3083822328 & 19041777196 & 0 & 8749601119 \\ -8840932504 & 52724642820 & 25782427487 & -3432529692 & 8749601126 & 7 \\ 3083822328 & 25782427487 & 48331024300 & 0 & 19041777196 & 3432529692 \\ 19041777196 & -3432529692 & 0 & 48331024300 & -3083822328 & 25782427477 \\ 0 & 8749601126 & 19041777196 & -3083822328 & 9930361952 & 8840932508 \\ 8749601119 & 7 & 3432529692 & 25782427477 & 8840932508 & 52724642813 \end{pmatrix}
\end{aligned}$$

C. Appendix: Table for the calculus

For an easier reading we write

$$\begin{aligned}
L &:= \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \end{array} + \begin{array}{c} \bullet \\ \bullet \end{array} - \frac{1}{34.7858}, \\
R &:= \sum_{i=0}^5 \left[(g_i^+)^T A^{i+} g_i^+ \right]_{\sigma_i} + \sum_{i \in \{1,2,3,5\}} \left[(g_i^-)^T A^{i-} g_i^- \right]_{\sigma_i} \\
&\quad + \sum_{i=0}^4 \left[(\overline{g_i^+})^T A^{i+} \overline{g_i^+} \right]_{\sigma_i} + \sum_{i=1}^3 \left[(\overline{g_i^-})^T A^{i-} \overline{g_i^-} \right]_{\sigma_i}.
\end{aligned}$$

In the following table the (i, j) 'th element of the matrix A^{k*} is denoted by $a_{i,j}^{k*}$. Because of the symmetry, we don't have to distinguish between $a_{i,j}^{k*}$ and $a_{j,i}^{k*}$. Each row in the following table belongs to the coefficient of G_i in equation (6).

i	$6!L$	$6!R$	$(6!L - 6!R) 10^3$	$6!R$ (in variables)
0	699.3019	699.3011	0.8277	$414720a_{0,0}^{0+}$
1	411.3019	411.3012	0.7348	$27648a_{0,0}^{0+} + 55296a_{0,1}^{0+} + 768a_{0,0}^{1+}$
2	267.3019	267.3018	0.0632	$13824a_{0,1}^{0+} + 1728a_{1,1}^{0+} + 13824a_{0,2}^{0+} + 384a_{0,1}^{1+} + 48a_{0,0}^{3+}$
3	123.3019	123.3018	0.0688	$5184a_{1,1}^{0+} + 1152a_{0,3}^{1+} + 1296a_{7,7}^{4+}$
4	75.3019	75.3019	0.0242	$2304a_{1,2}^{0+} + 32a_{1,1}^{1+} + 128a_{0,3}^{1+} + 128a_{1,3}^{1+} + 128a_{0,6}^{1+} + 32a_{0,6}^{3+} + 16a_{11,11}^{3+} + 288a_{5,7}^{4+} + 8a_{0,0}^{1-}$
5	27.3019	27.3019	0.0240	$768a_{2,2}^{0+} + 256a_{1,3}^{1+} + 128a_{3,3}^{1+} + 128a_{8,8}^{1+} + 64a_{0,8}^{3+} + 576a_{3,7}^{4+}$
6	27.3019	27.3019	0.0395	$27648a_{4,4}^{0+} + 768a_{3,3}^{1+} + 3456a_{1,7}^{4+}$
7	27.3019	27.3019	0.0274	$6912a_{3,4}^{0+} + 192a_{3,6}^{1+} + 12a_{6,6}^{3+} + 48a_{1,11}^{3+} + 432a_{1,5}^{4+} + 432a_{0,7}^{4+} + 432a_{1,7}^{4+} + 12a_{1,1}^{3-}$
8	27.3019	27.3019	0.0189	$4608a_{2,4}^{0+} + 32a_{6,6}^{1+} + 128a_{1,8}^{1+} + 32a_{6,8}^{3+} + 32a_{0,11}^{3+} + 288a_{1,3}^{4+} + 48a_{3,3}^{4+} + 288a_{1,5}^{4+} + 8a_{6,6}^{1-}$
9	75.3019	75.3019	0.0344	$13824a_{1,1}^{0+} + 384a_{0,8}^{1+} + 48a_{8,8}^{3+} + 432a_{1,1}^{4+} + 864a_{1,3}^{4+}$
10	219.3019	219.3018	0.1088	$138240a_{0,4}^{0+} + 4320a_{1,1}^{4+}$
11	219.3019	219.3017	0.1711	$27648a_{0,3}^{0+} + 27648a_{0,4}^{0+} + 96a_{1,1}^{3+} + 1728a_{0,1}^{4+}$
12	219.3019	219.3018	0.1373	$13824a_{0,2}^{0+} + 13824a_{0,3}^{0+} + 96a_{1,1}^{1+} + 96a_{0,1}^{3+} + 432a_{0,0}^{4+} + 24a_{0,0}^{1-}$
13	267.3019	267.3018	0.0632	$13824a_{0,1}^{0+} + 1728a_{1,1}^{0+} + 13824a_{0,2}^{0+} + 384a_{0,1}^{1+} + 48a_{0,0}^{3+}$
14	411.3019	411.3012	0.7348	$27648a_{0,0}^{0+} + 55296a_{0,1}^{0+} + 768a_{0,0}^{1+}$
15	699.3019	699.3011	0.8277	$414720a_{0,0}^{0+}$
16	75.3019	75.3018	0.0503	$3456a_{1,3}^{0+} + 128a_{0,6}^{1+} + 128a_{0,8}^{1+} + 16a_{1,1}^{3+} + 32a_{1,6}^{3+} + 32a_{8,11}^{3+} + 288a_{0,3}^{4+} + 48a_{5,5}^{4+}$
17	75.3019	75.3019	0.0242	$2304a_{1,2}^{0+} + 32a_{1,1}^{1+} + 128a_{0,3}^{1+} + 128a_{1,3}^{1+} + 128a_{0,6}^{1+} + 32a_{0,6}^{3+} + 16a_{11,11}^{3+} + 288a_{5,7}^{4+} + 8a_{0,0}^{1-}$
18	123.3019	123.3018	0.0688	$5184a_{1,1}^{0+} + 1152a_{0,3}^{1+} + 1296a_{7,7}^{4+}$
19	123.3019	123.3019	0.0397	$1728a_{1,1}^{0+} + 2304a_{0,2}^{0+} + 128a_{0,1}^{1+} + 32a_{1,1}^{1+} + 128a_{0,4}^{1+} + 32a_{0,2}^{3+} + 16a_{9,9}^{5+} - 8a_{0,0}^{1-}$
20	171.3019	171.3019	0.0469	$6912a_{1,1}^{0+} + 256a_{0,0}^{1+} + 512a_{0,2}^{1+} + 1024a_{0,0}^{2+}$
21	75.3019	75.3019	0.0128	$1152a_{1,2}^{0+} + 1728a_{1,3}^{0+} + 64a_{0,4}^{1+} + 32a_{1,4}^{1+} + 64a_{0,7}^{1+} + 16a_{0,1}^{3+} + 16a_{1,2}^{3+} + 4a_{2,2}^{3+} + 16a_{0,4}^{3+} + 144a_{0,2}^{4+} + 16a_{7,9}^{5+} + 8a_{0,2}^{1-} + 8a_{0,4}^{1-} + 4a_{0,0}^{3-}$
22	75.3019	75.3019	0.0329	$2304a_{1,2}^{0+} + 128a_{0,2}^{1+} + 128a_{1,2}^{1+} + 32a_{2,2}^{1+} + 128a_{0,5}^{1+} + 512a_{0,1}^{2+} + 16a_{0,0}^{3+} + 32a_{0,3}^{3+} + 8a_{1,1}^{1-}$
23	75.3019	75.3019	0.0183	$1728a_{1,3}^{0+} + 6912a_{0,7}^{0+} + 192a_{0,7}^{1+} + 48a_{1,4}^{3+} + 432a_{0,1}^{4+} + 432a_{1,2}^{4+} + 12a_{7,7}^{5+} + 12a_{4,4}^{5-}$
24	75.3019	75.3018	0.0843	$3456a_{1,3}^{0+} + 384a_{0,5}^{1+} + 192a_{1,1}^{2+} + 96a_{1,3}^{3+} + 432a_{0,0}^{4+} + 24a_{0,0}^{2-}$
25	27.3019	27.3019	0.0257	$1152a_{2,3}^{0+} + 64a_{1,6}^{1+} + 64a_{6,8}^{1+} + 16a_{1,6}^{3+} + 4a_{6,6}^{3+} + 16a_{0,8}^{3+} + 16a_{1,8}^{3+} + 16a_{0,11}^{3+} + 16a_{6,11}^{3+} + 144a_{0,5}^{4+} + 96a_{3,5}^{4+} + 4a_{1,1}^{3-}$
26	27.3019	27.3019	0.0240	$768a_{2,2}^{0+} + 256a_{1,3}^{1+} + 128a_{3,3}^{1+} + 128a_{8,8}^{1+} + 64a_{0,8}^{3+} + 576a_{3,7}^{4+}$
27	75.3019	75.3018	0.1055	$1536a_{2,2}^{0+} + 128a_{1,1}^{1+} + 1024a_{5,5}^{2+} + 128a_{5,5}^{3+} - 32a_{0,0}^{1-}$
28	27.3019	27.3019	0.0322	$768a_{2,2}^{0+} + 32a_{1,4}^{1+} + 64a_{1,6}^{1+} + 16a_{0,6}^{3+} + 8a_{2,6}^{3+} + 16a_{0,9}^{3+} + 16a_{9,11}^{3+} + 48a_{5,5}^{4+} + 16a_{3,9}^{5+} + 8a_{0,2}^{1-} + 8a_{0,4}^{1-} + 8a_{0,1}^{3-}$
29	27.3019	27.3019	0.0113	$768a_{2,2}^{0+} + 64a_{1,2}^{1+} + 32a_{1,4}^{1+} + 32a_{2,4}^{1+} + 256a_{0,3}^{2+} + 16a_{0,2}^{3+} + 4a_{2,2}^{3+} + 16a_{0,7}^{3+} + 16a_{8,9}^{5+} - 8a_{0,2}^{1-} + 8a_{1,3}^{1-} - 8a_{0,4}^{1-} + 8a_{1,4}^{1-} - 4a_{0,0}^{3-}$
30	27.3019	27.3019	0.0476	$1152a_{2,3}^{0+} + 32a_{1,4}^{1+} + 8a_{4,4}^{1+} + 256a_{4,5}^{2+} + 16a_{1,2}^{3+} + 16a_{0,5}^{3+} + 16a_{1,5}^{3+} + 16a_{2,5}^{3+} + 16a_{0,10}^{3+} + 144a_{0,4}^{4+} + 16a_{5,9}^{5+} - 8a_{0,2}^{1-} + 4a_{2,2}^{1-} + 4a_{2,3}^{1-} + 4a_{3,3}^{1-} - 8a_{0,4}^{1-} + 4a_{2,4}^{1-} + 4a_{3,4}^{1-} + 4a_{4,4}^{1-}$
31	27.3019	27.3019	0.0273	$1152a_{2,3}^{0+} + 32a_{1,7}^{1+} + 64a_{1,8}^{1+} + 16a_{1,4}^{3+} + 16a_{0,9}^{3+} + 16a_{1,9}^{3+} + 16a_{8,9}^{3+} + 4a_{9,9}^{3+} + 144a_{0,3}^{4+} + 48a_{2,3}^{4+} + 16a_{3,7}^{5+} + 8a_{0,5}^{1-} + 4a_{3,3}^{3-}$
32	27.3019	27.3019	0.0230	$768a_{2,2}^{0+} + 128a_{1,7}^{1+} + 64a_{0,4}^{3+} + 96a_{2,2}^{4+} + 16a_{7,7}^{5+} + 32a_{0,5}^{1-} - 16a_{4,4}^{5-}$
33	27.3019	27.3018	0.0632	$768a_{2,2}^{0+} + 256a_{1,5}^{1+} + 256a_{1,1}^{2+} + 64a_{0,3}^{3+} + 32a_{3,3}^{3+}$
34	27.3019	27.3018	0.0593	$1152a_{2,3}^{0+} + 64a_{1,5}^{1+} + 32a_{1,7}^{1+} + 128a_{1,3}^{2+} + 16a_{1,3}^{3+} + 16a_{3,4}^{3+} + 16a_{0,7}^{3+} + 16a_{1,7}^{3+} + 144a_{0,2}^{4+} + 8a_{7,8}^{5+} + 4a_{8,8}^{5+} - 8a_{0,5}^{1-} + 8a_{0,5}^{2-} + 8a_{4,5}^{5-} + 4a_{5,5}^{5-}$
35	27.3019	27.3019	0.0107	$4608a_{2,4}^{0+} + 64a_{1,7}^{1+} + 64a_{4,4}^{2+} + 16a_{4,4}^{3+} + 32a_{0,10}^{3+} + 288a_{1,2}^{4+} + 288a_{1,4}^{4+} + 16a_{5,7}^{5+} - 16a_{0,5}^{1-} + 8a_{3,3}^{2-} + 8a_{3,4}^{2-} + 8a_{4,4}^{2-} + 16a_{2,4}^{5-}$
36	27.3019	27.3018	0.0492	$1728a_{3,3}^{0+} + 384a_{3,8}^{1+} + 96a_{1,8}^{3+} + 144a_{3,3}^{4+} + 864a_{0,7}^{4+}$
37	27.3019	27.3018	0.0914	$1728a_{3,3}^{0+} + 1536a_{2,5}^{2+} + 96a_{1,5}^{3+} + 48a_{5,5}^{3+} + 864a_{0,6}^{4+}$
38	27.3019	27.3018	0.1161	$1728a_{3,3}^{0+} + 32a_{6,6}^{1+} + 32a_{1,9}^{3+} + 16a_{6,9}^{3+} + 32a_{1,11}^{3+} + 288a_{0,5}^{4+} + 16a_{3,3}^{5+} - 8a_{6,6}^{1-} + 16a_{1,3}^{3-}$

i	$6!L$	$6!R$	$(6!L - 6!R) 10^3$	$6!R$ (in variables)
39	27.3019	27.3019	0.0326	$1728a_{3,3}^{0+} + 64a_{3,3}^{2+} + 64a_{4,4}^{2+} + 32a_{1,7}^{3+} + 32a_{1,10}^{3+} + 288a_{0,4}^{4+} + 16a_{5,8}^{5+} + 8a_{2,2}^{2-} - 8a_{3,3}^{2-} - 8a_{3,4}^{2-} + 8a_{2,5}^{2-} + 8a_{5,5}^{2-} + 16a_{2,5}^{5-}$
40	27.3019	27.3019	0.0254	$6912a_{3,4}^{0+} + 384a_{2,4}^{2+} + 48a_{1,10}^{3+} + 432a_{1,4}^{4+} + 432a_{0,6}^{4+} + 432a_{1,6}^{4+} + 12a_{5,5}^{5+} + 24a_{1,4}^{2-} + 12a_{2,2}^{5-}$
41	27.3019	27.3018	0.0553	$27648a_{4,4}^{0+} + 1536a_{2,2}^{2+} + 3456a_{1,6}^{4+} + 96a_{1,1}^{2-}$
42	27.3019	27.3019	0.0257	$1152a_{2,3}^{0+} + 64a_{1,6}^{1+} + 64a_{6,8}^{1+} + 16a_{1,6}^{3+} + 4a_{6,6}^{3+} + 16a_{0,8}^{3+} + 16a_{1,8}^{3+} + 16a_{0,11}^{3+} + 16a_{6,11}^{3+} + 144a_{0,5}^{4+} + 96a_{3,5}^{4+} + 4a_{1,1}^{3-}$
43	27.3019	27.3018	0.0492	$1728a_{3,3}^{0+} + 384a_{3,8}^{1+} + 96a_{1,8}^{3+} + 144a_{3,3}^{4+} + 864a_{0,7}^{4+}$
44	27.3019	27.3019	0.0274	$6912a_{3,4}^{0+} + 192a_{3,6}^{1+} + 12a_{6,6}^{3+} + 48a_{1,11}^{3+} + 432a_{1,5}^{4+} + 432a_{0,7}^{4+} + 432a_{1,7}^{4+} + 12a_{1,1}^{3-}$
45	27.3019	27.3019	0.0395	$27648a_{4,4}^{0+} + 768a_{3,3}^{1+} + 3456a_{1,7}^{4+}$
46	-20.6981	-20.6981	0.0068	$64a_{3,4}^{1+} + 8a_{4,4}^{1+} + 64a_{3,6}^{1+} + 64a_{7,8}^{1+} + 8a_{2,6}^{3+} + 16a_{2,8}^{3+} + 16a_{4,11}^{3+} + 48a_{3,5}^{4+} + 144a_{2,7}^{4+} + 144a_{3,7}^{4+} + 16a_{1,9}^{5+} + 4a_{2,2}^{1-} + 4a_{2,3}^{1-} + 4a_{3,3}^{1-} + 4a_{2,4}^{1-} + 4a_{3,4}^{1-} + 4a_{1,4}^{1-} + 8a_{0,1}^{3-}$
47	-20.6981	-20.6981	0.0072	$64a_{2,3}^{1+} + 32a_{2,4}^{1+} + 64a_{3,4}^{1+} + 32a_{2,6}^{1+} + 256a_{0,4}^{2+} + 4a_{2,2}^{3+} + 8a_{2,6}^{3+} + 16a_{10,11}^{3+} + 144a_{4,7}^{4+} + 144a_{5,7}^{4+} + 16a_{6,9}^{5+} + 8a_{1,3}^{1-} + 8a_{1,4}^{1-} + 8a_{1,6}^{1-} + 4a_{0,0}^{3-} - 8a_{0,1}^{3-}$
48	-20.6981	-20.6981	0.0137	$96a_{2,2}^{1+} + 384a_{2,3}^{1+} + 1536a_{0,2}^{2+} + 864a_{6,7}^{4+} + 432a_{7,7}^{4+} + 24a_{1,1}^{4+}$
49	-20.6981	-20.6981	0.0080	$128a_{3,7}^{1+} + 32a_{7,7}^{1+} + 128a_{3,8}^{1+} + 16a_{4,4}^{3+} + 32a_{4,8}^{3+} + 96a_{2,3}^{4+} + 288a_{2,7}^{4+} + 16a_{1,7}^{5+} + 8a_{5,5}^{1-} + 16a_{0,4}^{5-}$
50	-20.6981	-20.6981	0.0106	$128a_{3,5}^{1+} + 128a_{3,7}^{1+} + 128a_{1,4}^{2+} + 32a_{3,4}^{3+} + 16a_{10,10}^{3+} + 48a_{2,2}^{4+} + 288a_{4,7}^{4+} + 16a_{6,7}^{5+} - 8a_{0,4}^{2-} + 16a_{3,4}^{5-}$
51	-20.6981	-20.6982	0.1165	$384a_{3,5}^{1+} + 768a_{1,2}^{2+} + 48a_{3,3}^{3+} + 432a_{6,6}^{4+} + 864a_{6,7}^{4+}$
52	-20.6981	-20.6981	0.0148	$32a_{4,6}^{1+} + 64a_{1,8}^{1+} + 4a_{6,6}^{3+} + 16a_{2,8}^{3+} + 16a_{6,8}^{3+} + 16a_{2,11}^{3+} + 48a_{3,3}^{4+} + 96a_{3,5}^{4+} + 16a_{0,9}^{5+} + 8a_{3,6}^{5+} + 8a_{4,6}^{5+} - 4a_{1,1}^{1-}$
53	-20.6981	-20.6981	0.0368	$256a_{2,8}^{1+} + 1024a_{0,5}^{2+} + 64a_{5,8}^{3+} + 32a_{8,8}^{3+} + 192a_{3,3}^{4+}$
54	-20.6981	-20.6982	0.0501	$128a_{2,6}^{1+} + 1024a_{2,5}^{2+} + 16a_{3,6}^{3+} + 64a_{3,7}^{3+} + 96a_{5,5}^{4+} + 32a_{1,6}^{1-} - 16a_{1,1}^{3-}$
55	-20.6981	-20.6981	0.0067	$32a_{2,6}^{1+} + 64a_{2,7}^{1+} + 64a_{2,8}^{1+} + 256a_{0,4}^{2+} + 16a_{4,6}^{3+} + 16a_{8,10}^{3+} + 16a_{8,11}^{3+} + 96a_{2,3}^{4+} + 48a_{4,5}^{4+} + 8a_{6,7}^{5+} + 4a_{7,7}^{5+} - 8a_{1,6}^{1-} - 8a_{3,4}^{5-} + 4a_{4,4}^{5-}$
56	-20.6981	-20.6981	0.0079	$32a_{2,4}^{1+} + 8a_{4,4}^{1+} + 64a_{1,7}^{1+} + 256a_{2,3}^{2+} + 16a_{2,4}^{3+} + 8a_{2,7}^{3+} + 48a_{2,2}^{4+} + 8a_{7,8}^{5+} + 16a_{7,9}^{5+} - 8a_{1,3}^{1-} - 4a_{2,3}^{1-} - 4a_{3,3}^{1-} - 8a_{1,4}^{1-} + 4a_{2,4}^{1-} - 4a_{3,4}^{1-} + 8a_{0,2}^{3-} - 8a_{4,5}^{5-}$
57	-20.6981	-20.6981	0.0193	$32a_{2,2}^{1+} + 64a_{2,4}^{1+} + 128a_{2,5}^{1+} + 512a_{0,1}^{2+} + 64a_{1,1}^{2+} + 32a_{2,3}^{3+} + 16a_{9,9}^{5+} - 8a_{1,1}^{1-} - 16a_{1,3}^{1-} - 16a_{1,4}^{1-} - 8a_{0,0}^{2-}$
58	-20.6981	-20.6982	0.0598	$384a_{5,2}^{1+} + 3072a_{0,0}^{2+} - 96a_{1,1}^{1-}$
59	-20.6981	-20.6981	0.0287	$128a_{2,5}^{1+} + 64a_{2,6}^{1+} + 64a_{1,1}^{2+} + 512a_{0,2}^{2+} + 256a_{1,2}^{2+} + 32a_{3,6}^{3+} + 16a_{11,11}^{3+} + 288a_{5,6}^{4+} - 16a_{1,6}^{1-} + 8a_{0,0}^{2-}$
60	-20.6981	-20.6981	0.0148	$32a_{4,6}^{1+} + 64a_{1,8}^{1+} + 4a_{3,6}^{3+} + 16a_{2,8}^{3+} + 16a_{6,8}^{3+} + 16a_{2,11}^{3+} + 48a_{3,3}^{4+} + 96a_{3,5}^{4+} + 16a_{0,9}^{5+} + 8a_{3,6}^{5+} + 8a_{4,6}^{5+} - 4a_{1,1}^{1-}$
61	-20.6981	-20.6981	0.0268	$8a_{4,4}^{1+} + 32a_{4,6}^{1+} + 256a_{3,5}^{2+} + 16a_{2,5}^{3+} + 8a_{2,6}^{3+} + 16a_{3,6}^{3+} + 16a_{3,7}^{3+} + 16a_{7,11}^{3+} + 48a_{5,5}^{4+} + 16a_{2,9}^{5+} - 4a_{2,2}^{1-} - 4a_{2,3}^{1-} - 4a_{2,4}^{1-} + 4a_{3,4}^{1-} + 8a_{3,6}^{1-} + 8a_{4,6}^{1-} - 8a_{0,1}^{3-}$
62	-20.6981	-20.6981	0.0373	$40a_{4,4}^{1+} + 20a_{2,2}^{3+} + 80a_{4,9}^{3+} - 20a_{2,2}^{1-} - 20a_{2,3}^{1-} - 20a_{2,4}^{1-} + 20a_{3,4}^{1-} - 20a_{0,0}^{3-}$
63	-20.6981	-20.6981	0.0077	$16a_{4,6}^{1+} + 16a_{4,7}^{1+} + 32a_{6,7}^{1+} + 8a_{4,6}^{3+} + 4a_{2,9}^{3+} + 8a_{4,9}^{3+} + 8a_{6,9}^{3+} + 8a_{2,11}^{3+} + 8a_{6,11}^{3+} + 96a_{2,5}^{4+} + 4a_{1,7}^{5+} + 8a_{3,7}^{5+} + 8a_{1,9}^{5+} + 4a_{2,5}^{1-} + 4a_{4,5}^{1-} - 4a_{3,6}^{1-} - 4a_{4,6}^{1-} + 4a_{0,3}^{3-} - 4a_{0,4}^{5-}$
64	-20.6981	-20.6982	0.0756	$24a_{4,4}^{1+} + 24a_{2,9}^{3+} + 12a_{9,9}^{3+} + 48a_{3,9}^{5+} - 12a_{2,3}^{1-} - 12a_{3,3}^{1-} + 12a_{2,4}^{1-} - 12a_{3,4}^{1-} + 24a_{0,3}^{3-} - 12a_{3,3}^{3-}$
65	-20.6981	-20.6981	0.0071	$8a_{4,4}^{1+} + 32a_{4,7}^{1+} + 64a_{4,4}^{2+} + 16a_{2,4}^{3+} + 16a_{2,10}^{3+} + 96a_{2,4}^{4+} + 8a_{5,7}^{5+} + 4a_{7,7}^{5+} + 16a_{5,9}^{5+} + 4a_{2,3}^{1-} - 4a_{2,4}^{1-} - 4a_{3,4}^{1-} - 4a_{4,4}^{1-} + 8a_{2,5}^{1-} + 8a_{4,5}^{1-} - 4a_{4,4}^{2-} - 8a_{2,4}^{5-} - 4a_{4,4}^{5-}$
66	-20.6981	-20.6981	0.0397	$8a_{4,4}^{1+} + 64a_{4,5}^{1+} + 64a_{1,11}^{2+} + 128a_{1,3}^{2+} + 16a_{2,3}^{3+} + 8a_{2,7}^{3+} + 16a_{3,7}^{3+} + 4a_{8,8}^{5+} + 16a_{8,9}^{5+} + 4a_{2,3}^{1-} - 4a_{2,4}^{1-} - 4a_{3,4}^{1-} - 4a_{4,4}^{1-} - 8a_{0,5}^{2-} - 8a_{0,2}^{3-} - 4a_{5,5}^{5-}$
67	-20.6981	-20.6981	0.0129	$32a_{4,5}^{1+} + 16a_{4,6}^{1+} + 64a_{1,3}^{2+} + 64a_{1,4}^{2+} + 8a_{3,6}^{3+} + 4a_{2,7}^{3+} + 4a_{6,7}^{3+} + 4a_{2,9}^{3+} + 8a_{3,9}^{3+} + 8a_{9,10}^{3+} + 8a_{4,5}^{4+} + 48a_{4,5}^{4+} + 8a_{3,8}^{5+} + 4a_{6,8}^{5+} + 8a_{6,8}^{5+} - 4a_{1,6}^{1-} - 4a_{4,6}^{1-} + 4a_{0,5}^{2-} + 4a_{0,2}^{3-} + 4a_{1,2}^{3-} - 4a_{0,3}^{3-} + 4a_{3,5}^{5-}$
68	-20.6981	-20.6981	0.0076	$16a_{4,7}^{1+} + 32a_{4,8}^{1+} + 64a_{3,4}^{2+} + 8a_{7,8}^{3+} + 4a_{2,9}^{3+} + 8a_{4,9}^{3+} + 4a_{7,9}^{3+} + 8a_{8,9}^{3+} + 8a_{2,10}^{3+} + 48a_{2,3}^{4+} + 48a_{3,4}^{4+} + 8a_{3,5}^{5+} + 4a_{2,7}^{5+} + 4a_{5,7}^{5+} + 8a_{2,9}^{5+} - 4a_{2,5}^{1-} - 4a_{4,5}^{1-} + 4a_{2,3}^{2-} + 2a_{2,4}^{2-} + 4a_{3,5}^{2-} - 4a_{0,3}^{3-} + 4a_{2,3}^{3-} + 4a_{1,4}^{5-} + 4a_{2,4}^{5-}$

i	$6!L$	$6!R$	$(6!L - 6!R) 10^3$	$6!R$ (in variables)
69	-20.6981	-20.6981	0.0071	$32a_{4,7}^{1+} + 64a_{3,3}^{2+} + 8a_{2,7}^{3+} + 16a_{4,7}^{3+} + 48a_{2,2}^{4+} + 16a_{4,7}^{5+} + 16a_{4,8}^{5+} + 8a_{7,8}^{5+} + 16a_{4,9}^{5+} - 8a_{2,5}^{1-} - 8a_{4,5}^{1-} - 4a_{2,2}^{2-} - 8a_{0,2}^{3-} + 8a_{4,5}^{5-}$
70	27.3019	27.3019	0.0189	$4608a_{2,4}^{0+} + 32a_{6,6}^{1+} + 128a_{1,8}^{1+} + 32a_{6,8}^{3+} + 32a_{0,11}^{3+} + 288a_{1,3}^{4+} + 48a_{3,3}^{4+} + 288a_{1,5}^{4+} + 8a_{6,6}^{1-}$
71	-20.6981	-20.6984	0.2833	$32a_{6,6}^{1+} + 128a_{5,8}^{1+} + 512a_{1,5}^{2+} + 16a_{5,5}^{3+} + 32a_{5,6}^{3+} + 32a_{5,8}^{3+} + 32a_{3,11}^{3+} + 96a_{3,5}^{4+} + 8a_{6,6}^{1-}$
72	27.3019	27.3018	0.1161	$1728a_{3,3}^{0+} + 32a_{6,6}^{1+} + 32a_{1,9}^{3+} + 16a_{6,9}^{3+} + 32a_{1,11}^{3+} + 288a_{0,5}^{4+} + 16a_{3,3}^{5+} - 8a_{6,6}^{1-} + 16a_{1,3}^{3-}$
73	-20.6981	-20.6981	0.0202	$32a_{6,6}^{1+} + 32a_{7,7}^{1+} + 64a_{3,3}^{2+} + 16a_{6,7}^{3+} + 32a_{4,11}^{3+} + 96a_{2,5}^{4+} + 16a_{1,8}^{5+} - 8a_{5,5}^{1-} - 8a_{6,6}^{1-} + 8a_{2,2}^{2-} + 8a_{2,5}^{2-} + 8a_{5,5}^{2-} + 16a_{1,2}^{3-} + 16a_{0,5}^{5-}$
74	-20.6981	-20.6981	0.0077	$16a_{4,6}^{1+} + 16a_{4,7}^{1+} + 32a_{6,7}^{1+} + 8a_{4,6}^{3+} + 4a_{2,9}^{3+} + 8a_{4,9}^{3+} + 8a_{6,9}^{3+} + 8a_{2,11}^{3+} + 8a_{6,11}^{3+} + 96a_{2,5}^{4+} + 8a_{1,3}^{5+} + 8a_{0,7}^{5+} + 4a_{1,7}^{5+} + 4a_{2,5}^{1-} + 4a_{4,5}^{1-} - 4a_{3,6}^{1-} - 4a_{4,6}^{1-} + 4a_{0,3}^{3-} + 4a_{0,4}^{5-}$
75	-20.6981	-20.6982	0.0582	$64a_{5,6}^{1+} + 64a_{1,4}^{2+} + 256a_{1,5}^{2+} + 16a_{3,9}^{3+} + 16a_{3,9}^{3+} + 8a_{6,9}^{3+} + 4a_{3,9}^{3+} + 16a_{5,10}^{3+} + 16a_{5,11}^{3+} + 48a_{4,5}^{4+} + 16a_{3,6}^{5+} - 4a_{0,4}^{2-} - 8a_{1,3}^{3-} + 4a_{3,3}^{3-}$
76	-20.6981	-20.6981	0.0141	$64a_{5,6}^{1+} + 128a_{1,2}^{2+} + 256a_{2,3}^{2+} + 64a_{1,4}^{2+} + 16a_{3,7}^{3+} + 8a_{6,7}^{3+} + 16a_{10,11}^{3+} + 144a_{4,6}^{4+} + 144a_{5,6}^{4+} + 8a_{6,8}^{5+} + 4a_{8,8}^{5+} + 4a_{0,4}^{2-} - 8a_{1,2}^{3-} - 8a_{3,5}^{5-} + 4a_{5,5}^{5-}$
77	-20.6981	-20.6981	0.0077	$32a_{6,7}^{1+} + 128a_{3,4}^{2+} + 8a_{2,7}^{3+} + 4a_{6,7}^{3+} + 8a_{6,10}^{3+} + 8a_{7,10}^{3+} + 8a_{7,11}^{3+} + 48a_{2,4}^{4+} + 48a_{4,5}^{4+} + 4a_{5,6}^{5+} + 4a_{2,7}^{5+} + 4a_{6,7}^{5+} + 4a_{2,8}^{5+} + 4a_{5,8}^{5+} - 4a_{1,2}^{3-} + 4a_{2,3}^{5-} - 4a_{1,4}^{5-} + 4a_{3,4}^{5-} + 4a_{1,5}^{5-} + 4a_{2,5}^{5-}$
78	-20.6981	-20.6981	0.0098	$64a_{5,7}^{1+} + 64a_{6,8}^{1+} + 128a_{1,4}^{2+} + 16a_{3,8}^{3+} + 16a_{4,8}^{3+} + 16a_{6,10}^{3+} + 16a_{3,11}^{3+} + 96a_{3,4}^{4+} + 48a_{2,5}^{4+} + 8a_{1,5}^{5+} + 4a_{5,5}^{5+} + 8a_{0,2}^{5-} + 4a_{2,2}^{5-}$
79	-20.6981	-20.6981	0.0068	$64a_{3,4}^{1+} + 8a_{1,4}^{1+} + 64a_{3,6}^{1+} + 64a_{7,8}^{1+} + 8a_{2,6}^{3+} + 16a_{2,8}^{3+} + 16a_{4,11}^{3+} + 48a_{3,5}^{4+} + 144a_{2,7}^{4+} + 144a_{3,7}^{4+} + 16a_{0,7}^{5+} + 4a_{2,2}^{1-} + 4a_{2,3}^{1-} + 4a_{3,3}^{1-} + 4a_{2,4}^{1-} + 4a_{3,4}^{1-} + 4a_{4,4}^{1-} + 8a_{0,1}^{3-}$
80	-20.6981	-20.6984	0.2833	$32a_{6,6}^{1+} + 128a_{5,8}^{1+} + 512a_{1,5}^{2+} + 16a_{5,5}^{3+} + 32a_{5,6}^{3+} + 32a_{5,8}^{3+} + 32a_{3,11}^{3+} + 96a_{3,5}^{4+} + 8a_{6,6}^{1-}$
81	-20.6981	-20.6981	0.0098	$64a_{5,7}^{1+} + 64a_{6,8}^{1+} + 128a_{1,4}^{2+} + 16a_{3,8}^{3+} + 16a_{4,8}^{3+} + 16a_{6,10}^{3+} + 16a_{3,11}^{3+} + 96a_{3,4}^{4+} + 48a_{2,5}^{4+} + 4a_{6,6}^{5+} + 8a_{6,7}^{5+} + 4a_{3,3}^{5-} - 8a_{3,4}^{5-}$
82	-20.6981	-20.6982	0.0571	$128a_{5,5}^{1+} + 128a_{8,8}^{1+} + 512a_{1,2}^{2+} + 256a_{2,2}^{2+} + 64a_{3,8}^{3+} + 576a_{3,6}^{4+} + 16a_{1,1}^{2-}$
83	-20.6981	-20.6983	0.2244	$256a_{5,5}^{1+} + 256a_{1,1}^{1+} + 1024a_{2,5}^{1+} + 128a_{3,5}^{3+} - 32a_{0,0}^{0-}$
84	-20.6981	-20.6981	0.0323	$64a_{5,7}^{1+} + 128a_{1,3}^{2+} + 256a_{4,5}^{2+} + 16a_{3,5}^{3+} + 16a_{4,5}^{3+} + 16a_{5,7}^{3+} + 4a_{7,7}^{3+} + 16a_{3,10}^{3+} + 48a_{2,4}^{4+} + 8a_{5,8}^{5+} + 8a_{7,8}^{5+} - 8a_{0,5}^{2-} + 4a_{2,2}^{3-} - 8a_{2,5}^{5-} - 8a_{4,5}^{5-}$
85	-20.6981	-20.6981	0.0148	$128a_{5,8}^{1+} + 128a_{1,4}^{2+} + 64a_{2,4}^{2+} + 32a_{3,10}^{3+} + 32a_{8,10}^{3+} + 96a_{3,4}^{4+} + 48a_{4,4}^{4+} + 16a_{5,6}^{5+} + 8a_{2,3}^{2-} + 8a_{0,4}^{2-} + 8a_{3,4}^{2-} + 8a_{4,4}^{2-} - 16a_{2,3}^{5-}$
86	-20.6981	-20.6981	0.0080	$128a_{3,7}^{1+} + 32a_{7,7}^{1+} + 128a_{3,8}^{1+} + 16a_{4,4}^{3+} + 32a_{4,8}^{3+} + 96a_{2,3}^{4+} + 288a_{2,7}^{4+} + 16a_{5,7}^{5+} + 8a_{1,5}^{1-} - 16a_{0,4}^{5-}$
87	-20.6981	-20.6981	0.0171	$32a_{7,7}^{1+} + 256a_{2,4}^{2+} + 512a_{2,5}^{2+} + 32a_{4,5}^{3+} + 32a_{5,10}^{3+} + 48a_{4,4}^{4+} + 288a_{2,6}^{4+} + 16a_{5,7}^{5+} + 8a_{1,5}^{1-} - 16a_{1,4}^{2-} - 16a_{2,4}^{5-}$
88	-20.6981	-20.6981	0.0202	$32a_{6,6}^{1+} + 32a_{7,7}^{1+} + 64a_{3,3}^{2+} + 16a_{6,7}^{3+} + 32a_{4,11}^{3+} + 96a_{2,5}^{4+} + 16a_{2,7}^{5+} - 8a_{5,5}^{1-} - 8a_{6,6}^{1-} + 8a_{2,2}^{2-} + 8a_{2,5}^{2-} + 8a_{5,5}^{2-} + 16a_{1,2}^{3-} + 16a_{1,4}^{5-}$
89	-20.6981	-20.6981	0.0077	$32a_{7,7}^{1+} + 64a_{4,4}^{2+} + 32a_{4,10}^{3+} + 96a_{2,4}^{4+} + 16a_{4,4}^{5+} + 32a_{4,5}^{5+} + 32a_{4,7}^{5+} - 8a_{5,5}^{1-} - 8a_{3,3}^{2-} - 8a_{3,4}^{2-}$
90	-20.6981	-20.6981	0.0101	$64a_{7,8}^{1+} + 256a_{2,3}^{2+} + 128a_{2,4}^{2+} + 4a_{7,7}^{3+} + 16a_{7,8}^{3+} + 16a_{4,10}^{3+} + 48a_{3,4}^{4+} + 144a_{2,6}^{4+} + 144a_{3,6}^{4+} + 8a_{2,5}^{5+} + 8a_{2,7}^{5+} + 8a_{1,4}^{2-} + 4a_{3,2}^{3-} + 8a_{1,2}^{5-} - 8a_{1,4}^{5-}$
91	-20.6981	-20.6982	0.0571	$128a_{5,5}^{1+} + 128a_{8,8}^{1+} + 512a_{1,2}^{2+} + 256a_{2,2}^{2+} + 64a_{3,8}^{3+} + 576a_{3,6}^{4+} + 16a_{1,1}^{2-}$
92	75.3019	75.3018	0.0503	$3456a_{1,3}^{0+} + 128a_{0,6}^{1+} + 128a_{0,8}^{1+} + 16a_{1,1}^{3+} + 32a_{1,6}^{3+} + 32a_{8,11}^{3+} + 288a_{0,3}^{4+} + 48a_{5,5}^{4+}$
93	-20.6981	-20.6982	0.0501	$128a_{2,6}^{1+} + 1024a_{0,5}^{2+} + 16a_{6,6}^{3+} + 64a_{5,11}^{3+} + 96a_{5,5}^{4+} + 32a_{1,6}^{1-} - 16a_{1,1}^{3-}$
94	-20.6981	-20.6981	0.0368	$256a_{2,8}^{1+} + 1024a_{2,5}^{1+} + 64a_{5,8}^{3+} + 32a_{8,8}^{3+} + 192a_{3,3}^{4+}$
95	-20.6981	-20.6982	0.0582	$64a_{5,6}^{1+} + 64a_{1,4}^{2+} + 256a_{1,5}^{2+} + 16a_{3,9}^{3+} + 16a_{5,9}^{3+} + 8a_{6,9}^{3+} + 4a_{9,9}^{3+} + 16a_{5,10}^{3+} + 16a_{5,11}^{3+} + 48a_{4,5}^{4+} + 16a_{3,5}^{5+} - 4a_{0,4}^{2-} - 8a_{1,3}^{3-} + 4a_{3,3}^{3-}$
96	-20.6981	-20.6982	0.0690	$64a_{3,3}^{2+} + 256a_{2,5}^{2+} + 16a_{5,7}^{3+} + 16a_{5,9}^{3+} + 16a_{7,9}^{3+} + 4a_{9,9}^{3+} + 8a_{2,8}^{5+} + 16a_{3,8}^{5+} - 4a_{2,2}^{2-} - 4a_{3,3}^{3-} - 8a_{1,5}^{5-}$
97	75.3019	75.3019	0.0344	$13824a_{1,4}^{0+} + 384a_{0,8}^{1+} + 48a_{8,8}^{3+} + 432a_{1,1}^{4+} + 864a_{1,3}^{4+}$
98	27.3019	27.3019	0.0273	$1152a_{2,3}^{0+} + 32a_{1,7}^{1+} + 64a_{1,8}^{1+} + 16a_{1,4}^{3+} + 16a_{0,9}^{3+} + 16a_{1,9}^{3+} + 16a_{8,9}^{3+} + 4a_{9,9}^{3+} + 144a_{0,3}^{4+} + 48a_{2,3}^{4+} + 16a_{1,3}^{5+} + 8a_{0,5}^{1-} + 4a_{3,3}^{3-}$

i	$6!L$	$6!R$	$(6!L - 6!R) 10^3$	$6!R$ (in variables)
99	-20.6981	-20.6981	0.0076	$16a_{4,7}^{1+} + 32a_{4,8}^{1+} + 64a_{3,4}^{2+} + 8a_{7,8}^{3+} + 4a_{2,9}^{3+} + 8a_{4,9}^{3+} + 4a_{7,9}^{3+} + 8a_{8,9}^{3+} + 8a_{2,10}^{3+} + 48a_{2,3}^{4+} + 48a_{3,4}^{4+} + 4a_{1,6}^{5+} + 8a_{3,6}^{5+} + 8a_{0,8}^{5+} + 4a_{1,8}^{5+} - 4a_{2,5}^{1-} - 4a_{4,5}^{1-} + 4a_{2,3}^{2-} + 2a_{2,4}^{2-} + 4a_{3,5}^{2-} - 4a_{0,3}^{3-} + 4a_{2,3}^{3-} + 4a_{0,3}^{5-} + 4a_{0,5}^{5-}$
100	-20.6981	-20.6981	0.0101	$64a_{7,5}^{1+} + 256a_{2,3}^{2+} + 128a_{2,4}^{2+} + 4a_{3,7}^{3+} + 16a_{7,8}^{3+} + 16a_{3,10}^{3+} + 16a_{4,10}^{3+} + 48a_{3,4}^{4+} + 144a_{2,6}^{4+} + 144a_{3,6}^{4+} + 8a_{3,8}^{5+} + 8a_{6,8}^{5+} + 8a_{1,4}^{2-} + 4a_{2,2}^{3-} - 8a_{0,5}^{5-} + 8a_{3,5}^{5-}$
101	-20.6981	-20.6981	0.0067	$32a_{2,6}^{1+} + 64a_{2,7}^{1+} + 64a_{2,8}^{1+} + 256a_{0,4}^{2+} + 16a_{4,6}^{3+} + 16a_{8,10}^{3+} + 16a_{8,11}^{3+} + 96a_{2,3}^{4+} + 48a_{4,5}^{4+} + 4a_{1,1}^{5+} + 8a_{1,5}^{5+} - 8a_{1,6}^{1-} + 4a_{0,0}^{5-} + 8a_{0,2}^{5-}$
102	-20.6981	-20.6981	0.0148	$128a_{5,8}^{1+} + 128a_{1,4}^{2+} + 64a_{4,4}^{2+} + 32a_{3,10}^{3+} + 32a_{8,10}^{3+} + 96a_{3,4}^{4+} + 48a_{4,4}^{4+} + 16a_{5,6}^{5+} + 8a_{2,3}^{2-} + 8a_{0,4}^{2-} + 8a_{3,4}^{2-} + 8a_{4,4}^{2-} + 16a_{2,3}^{5-}$
103	27.3019	27.3019	0.0322	$768a_{2,2}^{0+} + 32a_{1,4}^{1+} + 64a_{1,6}^{1+} + 16a_{0,6}^{3+} + 8a_{2,6}^{3+} + 16a_{0,9}^{3+} + 16a_{9,11}^{3+} + 48a_{5,5}^{4+} + 16a_{0,3}^{5+} + 8a_{0,2}^{5+} + 8a_{0,4}^{5+} + 8a_{0,1}^{5+}$
104	-20.6981	-20.6981	0.0268	$8a_{4,4}^{1+} + 32a_{4,6}^{1+} + 256a_{3,5}^{2+} + 16a_{2,5}^{3+} + 8a_{2,6}^{3+} + 16a_{3,6}^{3+} + 16a_{7,11}^{3+} + 48a_{5,5}^{4+} + 16a_{0,8}^{5+} - 4a_{2,1}^{1-} - 4a_{2,3}^{1-} - 4a_{2,4}^{1-} + 4a_{3,4}^{1-} + 8a_{3,6}^{1-} + 8a_{4,6}^{1-} - 8a_{0,1}^{3-}$
105	-20.6981	-20.6982	0.0690	$64a_{2,3}^{2+} + 256a_{3,5}^{2+} + 16a_{5,7}^{3+} + 16a_{5,9}^{3+} + 16a_{3,9}^{3+} + 4a_{9,9}^{3+} + 16a_{2,3}^{5+} + 8a_{2,8}^{5+} - 4a_{2,2}^{2-} - 4a_{3,3}^{3-} + 8a_{1,5}^{5-}$
106	-20.6981	-20.6981	0.0150	$128a_{3,4}^{2+} + 4a_{7,7}^{3+} + 8a_{7,9}^{3+} + 16a_{9,10}^{3+} + 48a_{4,4}^{4+} + 16a_{5,6}^{5+} + 16a_{3,4}^{5+} + 16a_{4,8}^{5+} + 8a_{6,8}^{5+} - 8a_{2,3}^{2-} - 4a_{2,4}^{2-} - 8a_{3,5}^{2-} - 4a_{2,2}^{3-} - 8a_{2,3}^{3-} - 8a_{3,5}^{3-}$
107	-20.6981	-20.6982	0.0935	$192a_{2,3}^{2+} + 24a_{7,7}^{3+} + 24a_{8,8}^{3+} - 24a_{5,5}^{2-} - 24a_{5,5}^{3-} - 24a_{2,2}^{3-} - 24a_{5,5}^{5-}$
108	-20.6981	-20.6981	0.0077	$32a_{6,7}^{1+} + 128a_{3,4}^{2+} + 8a_{4,7}^{3+} + 4a_{6,7}^{3+} + 8a_{6,10}^{3+} + 8a_{7,10}^{3+} + 8a_{7,11}^{3+} + 48a_{2,4}^{4+} + 48a_{4,5}^{4+} + 4a_{1,5}^{5+} + 4a_{2,6}^{5+} + 4a_{5,6}^{5+} + 4a_{1,8}^{5+} + 4a_{2,8}^{5+} - 4a_{1,2}^{3-} - 4a_{0,2}^{5-} - 4a_{1,3}^{5-} - 4a_{5,3}^{5-} - 4a_{0,5}^{5-} - 4a_{1,5}^{5-}$
109	-20.6981	-20.6981	0.0209	$64a_{3,3}^{2+} + 128a_{4,4}^{2+} + 32a_{7,10}^{3+} + 96a_{4,4}^{4+} + 8a_{5,5}^{5+} + 16a_{5,8}^{5+} - 8a_{4,4}^{2-} - 8a_{2,5}^{2-} - 8a_{5,5}^{2-} - 8a_{2,2}^{5-} - 16a_{2,5}^{5-}$
110	-20.6981	-20.6982	0.0756	$24a_{4,4}^{1+} + 24a_{2,2}^{2+} + 12a_{9,9}^{3+} + 48a_{0,3}^{5+} - 12a_{2,3}^{1-} - 12a_{3,3}^{1-} + 12a_{2,4}^{1-} - 12a_{3,4}^{1-} + 24a_{0,3}^{3-} - 12a_{3,3}^{3-}$
111	-20.6981	-20.6981	0.0129	$32a_{4,5}^{1+} + 16a_{4,6}^{1+} + 64a_{1,3}^{2+} + 64a_{1,4}^{2+} + 8a_{3,6}^{3+} + 4a_{2,7}^{3+} + 4a_{6,7}^{3+} + 4a_{2,9}^{3+} + 8a_{3,9}^{3+} + 8a_{3,10}^{3+} + 8a_{9,11}^{3+} + 48a_{4,5}^{4+} + 8a_{2,3}^{5+} + 8a_{0,5}^{5+} + 4a_{2,5}^{5-} - 4a_{1,6}^{1-} - 4a_{4,6}^{1-} + 4a_{0,5}^{2-} + 4a_{0,2}^{3-} + 4a_{1,2}^{3-} - 4a_{0,3}^{3-} + 4a_{1,2}^{5-}$
112	-20.6981	-20.6981	0.0150	$128a_{3,4}^{2+} + 4a_{7,7}^{3+} + 8a_{7,9}^{3+} + 16a_{9,10}^{3+} + 48a_{4,4}^{4+} + 16a_{2,4}^{5+} + 16a_{3,4}^{5+} + 8a_{2,5}^{5+} + 16a_{4,5}^{5+} - 8a_{2,3}^{2-} - 4a_{2,4}^{2-} - 8a_{3,5}^{2-} - 4a_{2,2}^{3-} - 8a_{2,3}^{3-} - 8a_{1,2}^{5-}$
113	-20.6981	-20.6981	0.0072	$64a_{2,3}^{2+} + 32a_{2,4}^{2+} + 64a_{3,4}^{2+} + 32a_{2,6}^{2+} + 256a_{0,4}^{3+} + 4a_{2,2}^{3+} + 8a_{2,6}^{3+} + 16a_{10,11}^{3+} + 144a_{4,4}^{4+} + 144a_{5,7}^{4+} + 16a_{0,5}^{5+} + 8a_{1,3}^{1-} + 8a_{1,4}^{1-} + 8a_{1,6}^{1-} + 4a_{3,0}^{3-} - 8a_{0,1}^{3-} - 8a_{0,1}^{5-}$
114	-20.6981	-20.6981	0.0106	$128a_{3,5}^{1+} + 128a_{3,7}^{1+} + 128a_{1,4}^{2+} + 32a_{3,4}^{3+} + 16a_{10,10}^{3+} + 48a_{2,2}^{4+} + 288a_{4,7}^{4+} + 16a_{1,5}^{5+} - 8a_{0,2}^{2-} - 16a_{0,2}^{5-}$
115	-20.6981	-20.6981	0.0322	$256a_{2,2}^{2+} + 512a_{2,4}^{2+} + 32a_{10,10}^{3+} + 576a_{4,6}^{4+} + 16a_{5,5}^{5+} - 16a_{1,1}^{2-} - 32a_{1,4}^{2-} - 16a_{2,2}^{5-}$
116	-20.6981	-20.6981	0.0141	$64a_{5,6}^{1+} + 128a_{1,2}^{2+} + 256a_{2,3}^{2+} + 64a_{1,4}^{2+} + 16a_{3,7}^{3+} + 8a_{6,7}^{3+} + 16a_{10,11}^{3+} + 144a_{4,6}^{4+} + 144a_{5,6}^{4+} + 4a_{0,2}^{5+} + 8a_{2,5}^{5+} + 4a_{0,4}^{5+} - 8a_{1,2}^{3-} + 4a_{1,1}^{5-} - 8a_{1,2}^{5-}$
117	-20.6981	-20.6981	0.0287	$128a_{2,5}^{1+} + 64a_{2,6}^{1+} + 64a_{1,1}^{2+} + 512a_{0,2}^{2+} + 256a_{1,2}^{2+} + 32a_{3,6}^{3+} + 16a_{11,11}^{3+} + 288a_{5,6}^{4+} - 16a_{1,6}^{1-} + 8a_{0,0}^{2-}$
118	-20.6981	-20.6981	0.0137	$96a_{2,2}^{1+} + 384a_{2,3}^{1+} + 1536a_{2,2}^{2+} + 864a_{6,7}^{4+} + 432a_{7,7}^{4+} + 24a_{1,1}^{1-}$
119	-20.6981	-20.6982	0.1165	$384a_{3,5}^{1+} + 768a_{1,2}^{2+} + 48a_{3,3}^{3+} + 432a_{6,6}^{4+} + 864a_{6,7}^{4+}$
120	-20.6981	-20.6982	0.0966	$2304a_{2,2}^{2+} + 2592a_{6,6}^{4+} - 144a_{1,1}^{2-}$
121	219.3019	219.3018	0.1373	$13824a_{0,2}^{0+} + 13824a_{0,3}^{0+} + 96a_{1,1}^{1+} + 96a_{0,1}^{3+} + 432a_{0,0}^{4+} + 24a_{0,0}^{1-}$
122	219.3019	219.3017	0.1711	$27648a_{0,3}^{0+} + 27648a_{0,4}^{0+} + 96a_{1,1}^{3+} + 1728a_{0,1}^{4+}$
123	219.3019	219.3018	0.1088	$138240a_{0,4}^{0+} + 4320a_{1,1}^{4+}$
124	75.3019	75.3019	0.0183	$1728a_{1,3}^{0+} + 6912a_{1,4}^{0+} + 192a_{0,7}^{1+} + 48a_{1,4}^{3+} + 432a_{0,1}^{4+} + 432a_{1,2}^{4+} + 12a_{1,1}^{5+} + 12a_{0,0}^{5-}$
125	27.3019	27.3019	0.0107	$4608a_{2,4}^{0+} + 64a_{1,7}^{1+} + 64a_{4,4}^{2+} + 16a_{4,4}^{3+} + 32a_{0,10}^{3+} + 288a_{1,2}^{4+} + 288a_{1,4}^{4+} + 16a_{1,6}^{5+} - 16a_{0,5}^{1-} + 8a_{3,3}^{2-} + 8a_{3,4}^{2-} + 8a_{4,4}^{2-} + 16a_{0,3}^{5-}$
126	27.3019	27.3019	0.0254	$6912a_{3,4}^{0+} + 384a_{2,4}^{2+} + 48a_{1,10}^{3+} + 432a_{1,4}^{4+} + 432a_{0,6}^{4+} + 432a_{1,6}^{4+} + 12a_{6,6}^{5+} + 24a_{1,4}^{2-} + 12a_{3,3}^{5-}$
127	27.3019	27.3018	0.0553	$27648a_{4,4}^{0+} + 1536a_{2,2}^{2+} + 3456a_{1,6}^{4+} + 96a_{1,1}^{2-}$
128	75.3019	75.3019	0.0128	$1152a_{1,2}^{0+} + 1728a_{1,3}^{0+} + 64a_{0,4}^{1+} + 32a_{1,4}^{1+} + 64a_{0,7}^{1+} + 16a_{0,1}^{3+} + 16a_{1,2}^{3+} + 4a_{2,2}^{3+} + 16a_{0,4}^{3+} + 144a_{0,2}^{4+} + 16a_{0,1}^{5+} + 8a_{0,2}^{1-} + 8a_{0,4}^{1-} + 4a_{0,0}^{3-}$
129	27.3019	27.3019	0.0476	$1152a_{2,3}^{0+} + 32a_{1,4}^{1+} + 8a_{4,4}^{1+} + 256a_{4,5}^{2+} + 16a_{1,2}^{3+} + 16a_{0,5}^{3+} + 16a_{1,5}^{3+} + 16a_{2,5}^{3+} + 16a_{0,10}^{3+} + 144a_{0,4}^{4+} + 16a_{0,6}^{5+} - 8a_{0,2}^{1-} + 4a_{2,2}^{1-} + 4a_{2,3}^{1-} + 4a_{3,3}^{1-} - 8a_{0,4}^{1-} + 4a_{2,4}^{1-} + 4a_{3,4}^{1-} + 4a_{4,4}^{1-}$

i	$6!L$	$6!R$	$(6!L - 6!R) 10^3$	$6!R$ (in variables)
130	27.3019	27.3018	0.0914	$1728a_{3,3}^{0+} + 1536a_{2,5}^{2+} + 96a_{1,5}^{3+} + 48a_{5,5}^{3+} + 864a_{0,6}^{4+}$
131	-20.6981	-20.6981	0.0171	$32a_{7,7}^{1+} + 256a_{2,4}^{2+} + 512a_{2,5}^{2+} + 32a_{4,5}^{3+} + 32a_{5,10}^{3+} + 48a_{4,4}^{4+} + 288a_{2,6}^{4+} +$ $16a_{1,6}^{5+} + 8a_{5,5}^{1-} - 16a_{1,4}^{2-} - 16a_{0,3}^{5-}$
132	-20.6981	-20.6981	0.0322	$256a_{2,2}^{1+} + 512a_{2,4}^{2+} + 32a_{10,10}^{3+} + 576a_{4,6}^{4+} + 16a_{6,6}^{5+} - 16a_{1,1}^{2-} - 32a_{1,4}^{2-} - 16a_{3,3}^{5-}$
133	-20.6981	-20.6982	0.0966	$2304a_{2,2}^{2+} + 2592a_{6,6}^{4+} - 144a_{1,1}^{2-}$
134	-20.6981	-20.6981	0.0071	$8a_{4,4}^{1+} + 32a_{4,7}^{1+} + 64a_{2,4}^{2+} + 16a_{2,4}^{3+} + 16a_{2,10}^{3+} + 96a_{2,4}^{4+} + 4a_{1,1}^{5+} + 16a_{0,6}^{5+} +$ $8a_{1,6}^{5+} + 4a_{2,3}^{1-} - 4a_{2,4}^{1-} - 4a_{3,4}^{1-} - 4a_{4,4}^{1-} + 8a_{2,5}^{1-} + 8a_{4,5}^{1-} - 4a_{4,4}^{2-} - 4a_{0,0}^{5-} - 8a_{0,3}^{5-}$
135	-20.6981	-20.6981	0.0209	$64a_{3,3}^{2+} + 128a_{4,4}^{2+} + 32a_{7,10}^{3+} + 96a_{4,4}^{4+} + 16a_{2,6}^{5+} + 8a_{6,6}^{5+} - 8a_{4,4}^{2-} - 8a_{2,5}^{2-} -$ $8a_{5,5}^{2-} + 16a_{1,3}^{5-} - 8a_{3,3}^{5-}$
136	-20.6981	-20.6981	0.0323	$64a_{5,7}^{1+} + 128a_{1,3}^{2+} + 256a_{4,5}^{2+} + 16a_{3,5}^{3+} + 16a_{4,5}^{3+} + 16a_{5,7}^{3+} + 4a_{7,7}^{3+} + 16a_{3,10}^{3+} +$ $48a_{2,4}^{4+} + 8a_{1,2}^{5+} + 8a_{2,6}^{5+} - 8a_{0,5}^{2-} + 4a_{2,2}^{3-} + 8a_{0,1}^{5-} + 8a_{1,3}^{5-}$
137	-20.6981	-20.6981	0.0077	$32a_{7,7}^{1+} + 64a_{4,4}^{2+} + 32a_{4,10}^{3+} + 96a_{2,4}^{4+} + 32a_{1,4}^{5+} + 16a_{4,4}^{5+} + 32a_{4,6}^{5+} - 8a_{5,5}^{1-} -$ $8a_{3,3}^{2-} - 8a_{3,4}^{2-}$
138	27.3019	27.3019	0.0326	$1728a_{3,3}^{0+} + 64a_{3,3}^{2+} + 64a_{4,4}^{2+} + 32a_{1,7}^{3+} + 32a_{1,10}^{3+} + 288a_{0,4}^{4+} + 16a_{2,6}^{5+} +$ $8a_{2,2}^{2-} - 8a_{2,3}^{2-} - 8a_{3,4}^{2-} + 8a_{2,5}^{2-} + 8a_{5,5}^{2-} - 16a_{1,3}^{5-}$
139	27.3019	27.3019	0.0230	$768a_{2,2}^{0+} + 128a_{1,7}^{1+} + 64a_{0,4}^{3+} + 96a_{2,2}^{4+} + 16a_{1,1}^{5+} + 32a_{0,5}^{1-} - 16a_{0,0}^{5-}$
140	-20.6981	-20.6981	0.0079	$32a_{2,4}^{1+} + 8a_{4,4}^{1+} + 64a_{2,7}^{1+} + 256a_{0,3}^{2+} + 16a_{2,4}^{3+} + 8a_{2,7}^{3+} + 48a_{2,2}^{4+} + 16a_{0,1}^{5+} +$ $8a_{1,2}^{5+} - 8a_{1,3}^{1-} - 4a_{2,3}^{1-} - 4a_{3,3}^{1-} - 8a_{1,4}^{1-} + 4a_{2,4}^{1-} - 4a_{3,4}^{1-} + 8a_{0,2}^{3-} + 8a_{0,1}^{5-}$
141	-20.6981	-20.6981	0.0071	$32a_{4,7}^{1+} + 64a_{3,3}^{2+} + 8a_{2,7}^{3+} + 16a_{4,7}^{3+} + 48a_{2,2}^{4+} + 8a_{1,2}^{5+} + 16a_{0,4}^{5+} + 16a_{1,4}^{5+} +$ $16a_{2,4}^{5+} - 8a_{2,5}^{1-} - 8a_{4,5}^{1-} - 4a_{2,2}^{2-} - 8a_{0,2}^{3-} - 8a_{0,1}^{5-}$
142	27.3019	27.3018	0.0593	$1152a_{2,3}^{0+} + 64a_{1,5}^{1+} + 32a_{1,7}^{1+} + 128a_{1,3}^{2+} + 16a_{1,3}^{3+} + 16a_{3,4}^{3+} + 16a_{0,7}^{3+} +$ $16a_{1,7}^{3+} + 144a_{0,2}^{4+} + 8a_{1,2}^{5+} + 4a_{2,2}^{5+} - 8a_{0,5}^{1-} + 8a_{0,5}^{2-} - 8a_{0,1}^{5-} + 4a_{1,1}^{5-}$
143	75.3019	75.3018	0.0843	$3456a_{1,3}^{0+} + 384a_{0,5}^{1+} + 192a_{1,1}^{2+} + 96a_{1,3}^{3+} + 432a_{0,0}^{4+} + 24a_{0,0}^{2-}$
144	123.3019	123.3019	0.0397	$1728a_{1,1}^{0+} + 2304a_{1,2}^{0+} + 128a_{0,1}^{1+} + 32a_{1,1}^{1+} + 128a_{0,4}^{1+} + 32a_{0,2}^{3+} + 16a_{0,0}^{5+} - 8a_{0,0}^{1-}$
145	75.3019	75.3018	0.1055	$1536a_{2,2}^{0+} + 128a_{1,1}^{1+} + 1024a_{5,5}^{2+} + 128a_{0,5}^{3+} - 32a_{0,0}^{1-}$
146	-20.6981	-20.6983	0.2244	$256a_{1,1}^{1+} + 256a_{5,5}^{2+} + 1024a_{5,5}^{2+} + 128a_{3,5}^{3+} - 32a_{0,0}^{2-}$
147	27.3019	27.3019	0.0113	$768a_{2,2}^{0+} + 64a_{1,2}^{1+} + 32a_{1,4}^{1+} + 32a_{2,4}^{1+} + 256a_{0,3}^{2+} + 16a_{0,2}^{3+} + 4a_{2,2}^{3+} + 16a_{0,7}^{3+} +$ $16a_{0,2}^{5+} - 8a_{0,2}^{1-} + 8a_{1,3}^{1-} - 8a_{0,4}^{1-} + 8a_{1,4}^{1-} - 4a_{0,0}^{3-}$
148	-20.6981	-20.6981	0.0373	$40a_{4,4}^{1+} + 20a_{2,2}^{3+} + 80a_{0,4}^{5+} - 20a_{2,2}^{1-} - 20a_{2,3}^{1-} - 20a_{2,4}^{1-} + 20a_{3,4}^{1-} - 20a_{0,0}^{3-}$
149	-20.6981	-20.6981	0.0397	$8a_{4,4}^{1+} + 64a_{4,5}^{1+} + 64a_{2,4}^{2+} + 128a_{1,3}^{2+} + 16a_{2,3}^{3+} + 8a_{2,7}^{3+} + 16a_{3,7}^{3+} + 16a_{0,2}^{5+} +$ $4a_{2,2}^{5+} + 4a_{2,3}^{1-} - 4a_{2,4}^{1-} - 4a_{3,4}^{1-} - 4a_{4,4}^{1-} - 8a_{0,5}^{2-} - 8a_{0,2}^{3-} - 4a_{1,1}^{5-}$
150	-20.6981	-20.6982	0.0935	$192a_{3,3}^{2+} + 24a_{7,7}^{3+} + 24a_{2,2}^{5+} - 24a_{2,5}^{2-} - 24a_{5,5}^{2-} - 24a_{2,2}^{3-} - 24a_{1,1}^{5-}$
151	-20.6981	-20.6981	0.0193	$32a_{2,2}^{1+} + 64a_{2,4}^{1+} + 128a_{2,5}^{1+} + 512a_{0,1}^{2+} + 64a_{1,1}^{2+} + 32a_{2,3}^{2+} + 16a_{0,0}^{5+} - 8a_{1,1}^{1-} -$ $16a_{1,3}^{1-} - 16a_{1,4}^{1-} - 8a_{0,0}^{2-}$
152	75.3019	75.3019	0.0329	$2304a_{1,2}^{0+} + 128a_{0,2}^{1+} + 128a_{1,2}^{1+} + 32a_{2,2}^{1+} + 128a_{0,5}^{1+} + 512a_{0,1}^{2+} + 16a_{0,0}^{3+} +$ $32a_{0,3}^{3+} + 8a_{1,1}^{1-}$
153	27.3019	27.3018	0.0632	$768a_{2,2}^{0+} + 256a_{1,5}^{1+} + 256a_{1,1}^{2+} + 64a_{0,3}^{3+} + 32a_{3,3}^{3+}$
154	171.3019	171.3019	0.0469	$6912a_{1,1}^{0+} + 256a_{0,0}^{1+} + 512a_{0,2}^{1+} + 1024a_{0,0}^{2+}$
155	-20.6981	-20.6982	0.0598	$384a_{2,2}^{1+} + 3072a_{0,0}^{2+} - 96a_{1,1}^{1-}$